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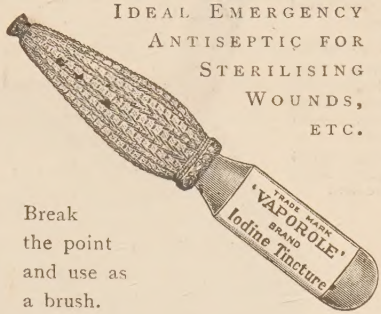

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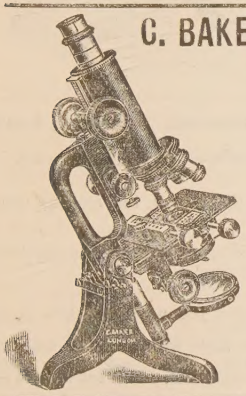

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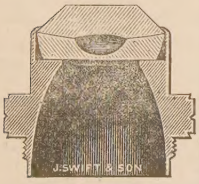

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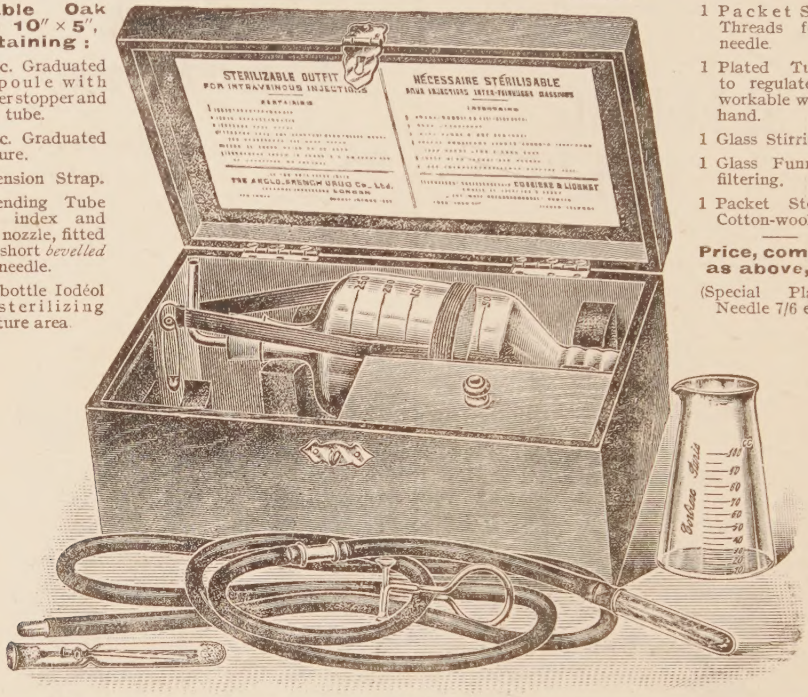

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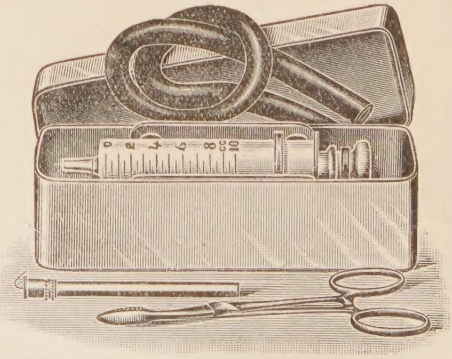

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TROPICAL DISEASES BULLETIN.

Vol. 8.] 1916. [No. 8.

TYPHUS.

MOON (R. O.). **The Chadwick Lectures on Typhus Fever in Serbia. Delivered at the Royal Society of Medicine on Oct. 20th and 29th, and Nov. 3rd 1915.**—*Lancet.* 1916. May 27. pp. 1069–1073; June 3. pp. 1111–1114; June 10. pp. 1157–1160.

These papers contain an interesting survey of typhus fever. The history of the various outbreaks from 1700 A.D. to the present time is detailed, and especial note is made of the association of typhus with war and famine periods. The influence of climate also is considered. In Serbia there would have been no typhus epidemic had there been no war. The epidemic "took its origin among the Austrian prisoners." The starting point appeared to be Valjevo, not far from the Bosnian frontier. The direction of spread was south-east and then south. The appalling sanitary conditions resulting from inadequate means of coping with the epidemic are fully described. Overcrowding, physical exhaustion and ill-nourishment all contributed to the loss of life. Under the International Sanitary Commission "to the British had fallen the care of the [Serbian] army and most of the hospital work except that done by the Serbians themselves."

An interesting account of the resemblance and former confusion between typhus and plague, from early times onwards, is given. The account of relapsing fever in Serbia is important and from all the author's personal experience it is noted that "there is more actual suffering in relapsing fever than in typhus, though the former is a much less serious disease." Convalescence from relapsing fever is apt to be slow compared with that from typhus, and it confers but little immunity With regard to the specific agent of relapsing fever, the author considers that "this spirillum or its spores are given off with the breath or from the skin and are received into the air vesicles of the lungs with the inhaled air." [Apparently the work of NICOLLE, BLAIZOT and CONSEIL, as well as that of SERGENT on the transmission of relapsing fever by the crushing of infected lice on to the skin, is not known to the author.] The supposed connection between typhoid and typhus is discussed and the difference indicated.

The third lecture is devoted to the prophylaxis and treatment of typhus. Stress is laid on sanitation and personal cleanliness, on combating, overcrowding and lack of ventilation, and coping with problems incidental to destitution. With regard to treatment,

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absolute rest in bed is essential. The sickroom should contain only what is indispensable for the care of the patient. Thorough ventilation is a necessity. Hydrotherapy is most useful. The diet should be mainly milk, but there is no objection to giving solid food if the patient's mental condition allows of his swallowing it. Attention must be given particularly to the nervous system and to the heart.

A. Porter.

HOWELL (B. Whitworth). **The Typhus Fever Epidemic in Serbia 1915.** —*St. Bart. Hosp. Jl.* 1916. Feb. Vol 23. No. 5. pp. 52–54. With 1 chart.

The author gives an account of his experiences of the typhus epidemic at Vrnjatchka Banja, Serbia, in 1915. He states that there is no doubt that lice transmit the disease, and that perhaps fleas and bugs also have a share. The Serbians believed in infection by inhalation. The majority of the patients were Austrians, the rest Serbian with a few civilians and English nurses. The mortality was much greater among the Austrians, who were prisoners of poor physique. The patients generally arrived in a state of collapse. It was found essential that the hair of the head and pubic region should be shaved and treated with paraffin oil or mercury ointment, but even then, fresh crops of lice appeared. The incubation period was about twelve days. The initial symptoms were like those of influenza. Deafness was frequent and persisted throughout the disease. It was sometimes very obstinate. "The drunken look about the eye was very characteristic, the conjunctivae being much injected. This was an early sign, beginning just after the onset and before the rash; hence the diagnosis could often be fairly safely made before the appearance of the rash." The rash on the average appeared on the fifth day. The macules were at first red, later they became slightly raised and purplish in colour. A number of them became regular petechiae, extravasation of blood occurring. The mental symptoms took two forms, one "a low muttering delirium, with much muscular weakness, the other, wild and maniacal."

The commoner complications were broncho-pneumonia, otitis media and deafness, parotitis, laryngitis, gangrene, hemiplegia, neuritis and melanuria.

It was found that "the older the patient, the higher the mortality." Violently delirious patients did badly. The treatment varied only in detail. In general it was stimulative. Plenty of fresh air and good plain food were given. The alleviation of oral and faucial sepsis was imperative, hydrogen peroxide being chiefly used for this purpose. The Serbians were not in favour of alcohol. The author's Unit used it a good deal in half-ounce doses, increasing it as the pulse got weaker. Aspirin and phenacetin and caffeine citrate were given for headache. Digitalis was given by the mouth and hypodermically, no digitalin being available. Strychnine also was given.

Personal prophylaxis involved the use of long linen gowns tightly buttoned over the collar and wrists, gum boots or Wellingtons, frequent change of linen and systematic search for lice. Some members anointed themselves with paraffin or vermijelly. Rooms were fumigated with sulphur. The dead were buried as quickly as possible, as they rapidly decomposed.

A. P.

CHESNEY (Lilian Mary). **Typhus Work in Serbia.**—*Practitioner.* 1916. May. Vol. 96. No. 5. (No. 575). pp. 542–550.

This paper contains an account of the author's recollections of ten months' work in Serbia, documents and note books having been lost with equipment. The hospitals with which the author was connected were stationed at Kragujevatz, a large barracks being used as a hospital.

The typhus fever epidemic described was initiated by Austrians, spread to the soldiers and then to the civil population. Many of the members of the Serbian Medical Service were victims. At the time when the writer reached Serbia, the medical organization there was more or less paralysed by the magnitude of the task, and cases of typhus were not separated from others. A separation was effected and in about a week the typhus patients alone were in the hospital, the other cases being distributed among other hospitals in the town. The wards were clean and not allowed to be overcrowded ; one patient only was allowed in each bed. Bathing arrangements were made, were rough and ready, but not bad. Owing to difficulties in obtaining wood, the sole fuel, heating combined with ventilation was difficult. Lice were eliminated but fleas could not be abolished. The hospital itself was easily kept clean. The great difficulty was the sanitary arrangements, cesspools, sometimes within the building and sealed up when full, being in use. "The whole building was chronically pervaded by the smell of overflowing cesspools. The cesspool also overflowed outside into the laundry, which was not a desirable arrangement, but it did not seem to disturb the mind of our director at all." Coffins were mere open shells and were used repeatedly, the bodies being tilted out into pits on reaching the cemetery.

There were 200 beds in the hospital. Each ward had two English Sisters and a Serbian and two Austrian prisoners as orderlies. The prisoners liked the work, made good nurses and were preferred by the Serbs as nurses to their own countrymen. The typhus was usually of a severe type. Nearly all the cases had the rash developed before they were brought in for treatment. The stronger men suffered more severely than the weaker ones. "The very wretched Austrian prisoners, of course, often died, generally from heart failure, at or just before the crisis." The majority of deaths occurred at the crisis. There were very few complications, parotitis being the most common. In Serbian hospitals, where there were no nurses, post-typhus gangrene was extremely common. "It is of a moist, absolutely stinking variety, and, once begun, there is nothing for it but to amputate high up." Many forms of treatment were tried. In the opinion of the author, one treatment did as well as another. The chief point was good nursing. Ordinary Serbian diet was used as far as possible, owing to Serbian prejudices. While the louse was considered the chief transmitter, it is thought that other agents and means of infection must occur.

A. P.

TULLIDGE (E. Kilbourne). **Fleck Typhus. The Scourge of the Eastern War Theatre.**—*New York Med. Jl.* 1916. June 17. Vol. 103. No. 25. Whole No. 1959. pp. 1167–1169. With 2 text figs.

This paper contains an interesting general account of typhus as observed in the Eastern War Theatre. The symptoms, especially the

appearance of the rash, are given, and body lice are held to be the chief transmitters. A short history of the losses due to typhus in the wars in Mexico, the American Civil war, the Spanish war and the Balkan wars is given. In the last-mentioned, the losses were particularly severe among the Bulgars. On the Eastern Front, *Acarus scabiei* is a very great pest to the men, almost as great as lice, so that measures are taken against them in some places, as at Miskolcz, where the author worked.

The lice problem was dealt with vigorously. The men were thoroughly washed. their clothes were sterilised and they were shaved, "not one hair being allowed to remain on the body." They were then bathed again and sprayed all over with gasolene. A third bath after ten minutes finished the disinfection, and then the patients were sent to the hospital wards. In spite of these precautions, lice found their way into the wards, and the doctors and staff had to use protective clothing.

The treatment of typhus is considered unsatisfactory. Nervous symptoms need prolonged attention. "Spirit of nitrous ether to relieve congestion and reduce the extremely high fever was without an equal." For improving the heart action and the general condition, strychnine, spartine, strophanthin and thyroid extract were good. The author thinks that the latter remedy should be used with more confidence.

A. P.

McNeil (H. L.). **Endemic Typhus Fever in South Texas.**—*Texas State Jl. Med.* 1916. Aug. Vol. 12. No. 4. pp. 188–191.

Endemic typhus is believed by the author to be present in a mild form in Texas, at any rate in the southern part. Cases that have been classed as mild and atypical typhoid are now thought to be mild typhus. Five cases that occurred prior to the recent outbreak in Mexico, are now described. None occurred in Mexicans and one only had been in Mexico.

A resumé of Brill's description of the disease that until recently bore his name is then given, and is followed by an account of the five cases that came under the author's observation. In each case the onset of the illness was by a chill. Widal's reaction was negative in the four cases in which it was possible to perform it, and the blood cultures of the same four cases were also negative. All the cases showed a rash. One case terminated fatally. Plotz's work had not been published at the time, so that cultures made anaerobically after his method were not available.

In conclusion attention is drawn to the fact that "the hemorrhagic type of typhoid fever, characterised by numerous petechiae over the abdomen and body as well as by the severity of the illness may be very readily confused with a severe hemorrhagic case of typhus unless both blood counts, Widal's and blood cultures are made." The author believes, however, that the mild form of typhus can, as a rule, be readily distinguished clinically from typhoid.

A. P.

HAIGHT (H. H.). **Endemic Typhus Fever in Toronto.**—*Canadian Pract. & Rev.* 1916. May. Vol. 41. No. 5. pp. 185–191.

This paper records an interesting case of infection with septic rash, which is now believed, in the light of recent research, to have been really a case of typhus. The patient, seen in 1913, was a teacher in a district of Toronto where the pupils consisted for the most part, of new arrivals from South-Eastern Europe. Malaise, general indisposition and soreness of the scalp characterised the case when it first came under observation. The teacher attributed her condition to contact with the dirty children whom she taught. A few sores of pinhead size were scattered over the crown and the scalp was tender. The post-trochlear glands were visibly enlarged and superficial cervical glands generally palpable. On the third day the patient showed profound shock, an ashen facies, sunken eyes, lips covered with sordes, with pain in the back and lower extremities. The case was believed to be one of small-pox and measures were taken accordingly with the other inmates of the house. On the fourth day, rose-coloured spots appeared on the trunk and limbs. On the fifth day, " splashes of blue, blue-black and blue-red covered the body, elderberry splashes I would call them ; all sizes but all spots essentially splashes in contour and outline ; beautifully rose-tinted spots were sparingly scattered over the uncolored skin between the elderberry splashes." On the sixth day, spots were found on the nape of the neck and head lice were also found. From then improvement occurred ; by the ninth day, the temperature was normal and the progress of convalescence uneventful. The author's original diagnosis of " phthiriasis septic infection " is explained, and the author gives a discussion as to the possibility of the head louse transmitting typhus,* and as to the identity of Brill's disease with typhus and concludes with some general remarks on the character of typhus as a " verminous disease of uncleanliness."

A. P.

ARCHIVES DE L'INSTITUT PASTEUR DE TUNIS. 1916. Sept. Vol. 9. No. 4. pp. 215–290. With 62 Charts. **Nouvelles études sur le typhus exanthématique pratiquées à l'Institut Pasteur de Tunis et dans les formations sanitaires de la Régence** (1916). NICOLLE (Charles), BLAIZOT (Ludovic), POTEL (Réné) & POIRSON (Henri).

The substance of this collection of papers has in part been published [see this *Bulletin*, Vol. 7, p. 62]. Other portions are summarised in this number.

NICOLLE (Charles). **Identité des virus exanthématiques africain et balkanique.**—*Bull. Soc. Path. Exot.* 1916. June. Vol. 9. No. 6. pp. 402–410. With 9 charts.

The author discusses the problem of the plurality of the virus of typhus. He first proved the rôle of the louse in typhus transmission, using the Tunisian virus. Patients from Algiers and Morocco came

* [GOLDBERGER and ANDERSON (1912) have transmitted Mexican typhus by means of the head-louse. See also in this connection this *Bulletin*, Vol. 6, p. 386.]

to Tunis, and by experiments the identity of these viruses with the Tunisian one was established. The complete verification of the identity of the African and Balkan typhus virus was obtained by observations of Serbian patients and by experiments with the virus from them. Clinically the Balkan form was like that in Berbery. Relatively benign to the population where it is endemic, its severity was very great to infected Frenchmen. A specific used reduced the mortality among the French who were treated to 3 in 25. The untreated cases died. There are no details as to the nature of the specific. The Serbian virus is identical in its effects on the monkey and the guinea-pig with the Berberan virus.

By experiments it has been shown that an effective inoculation of African typhus virus protected against a subsequent inoculation with Balkan typhus virus and vice versa. Details of the experiments are given, and also the temperature charts of the monkeys and guinea-pigs used.

A. P.

NICOLLE (C.) & BLAIZOT (L.). **Sur les resultats de la sérothérapie dans le traitement du typhus exanthématique.**—*Bull. Acad. Méd.* 1916. Aug. 1. Vol. 76. Year 80. No. 31. pp. 99–101.

In a previous paper [see this *Bulletin*, Vol. 8, p. 62] the authors have shown the effect of serotherapeutical treatment on animals. The serum was inoculated intravenously, and was obtained from an ass and a horse that had been inoculated intravenously with emulsions of the organs of guinea-pigs infected with typhus, those organs that had been shown to be the least toxic and the most virulent being employed. These were usually the suprarenal bodies and the spleen. The present paper is concerned with the results of the administration of similar serum to 38 human patients, of whom 22 were French, 9 natives of Tunis, and 7 Serbs ; 31 were treated at one hospital and 7 at another. Ass serum was exclusively used, and was taken after the 30th, 60th, 80th, 99th and 103rd inoculations of the animal, these inoculations being repeated about every third or fourth day.

Out of the 38 patients treated, one only died. This patient was a French nurse who also suffered from tubercle, and death was unconnected with typhus. Among the Serbs, it was found that the typhus was relatively benign, with the result that only seven cases were treated and these were selected because their malady was of a severe type. Among the French, on the other hand, the typhus was of a very severe type and there were a large proportion of deaths before the treatment was introduced.

M. POTEL, a colleague of the authors, who had the treatment of many of the patients in his clinic, reported very favourably on the results of the treatment with serum, with respect to the following points :—

(1). Action on the temperature. In typhus cases treated according to former methods, there was a period during which the temperature remained at a level of about 40° C. In cases treated by serotherapy, this level did not appear or it ceased abruptly after the first injection.

(2). Action on nervous symptoms. In cases under serum treatment, stupor, delirium and prostration did not appear or rapidly disappeared. Other nervous symptoms such as insomnia or excitement soon lessened. Incontinence of the bowels and bladder, such as is common in the

second week of illness, was seldom observed, and the same applied to nervous dyspnoea, cutaneous hyperaesthesia, trembling of the lips and general tremors. Sacral sloughing, common in patients under ordinary treatment and usually of nervous origin, has generally been absent from patients who have benefited from the serum treatment.

(3). Action on the general condition. Owing to the absence of cerebral complications, the general condition was greatly ameliorated. The condition of the tongue remained good, the urine was abundant, the heart and the lungs were in good condition, while constipation was absent.

(4). Action on the length of illness. After one or two inoculations the number of patients in whom defervescence occurred after 6 to 12 days was numerous, 14 days being the usual time in cases under the old treatment. The average duration of the cases treated with serum was 11·61 days, as compared with the averages of 13·63 and 14·52 days obtained by previous workers using the older methods of treatment.

(5). Action on complications. None of the patients treated by serum presented any complication, a most unusual circumstance.

(6). Action on the severity of the illness. In typhus epidemics, the mortality has varied from 22 to 50 per cent. of the patients. The present authors have had a percentage of deaths less than 3 per cent., one patient only having succumbed out of 31 and that from inflammation of the lungs, and not from typhus. The curative action of the serum then, seems remarkably efficient.

The authors consider that it is important to commence serotherapy early in the infection, and the inoculations should be continued every two days until defervescence or a great amelioration in the condition of the patient occurs. 20 to 30 cc. of serum each day should be used. Hypodermic injections have always been used in the case of man.

Medical treatment to aid in the elimination of the toxic products from the body is used to aid the serotheropathy. Abundant diuretic drinks, stimulants and tonics for the heart, and in very toxic cases the administration of artificial serum have been adopted. Baths have an antithermic action but have been used to increase the action of the skin, calm agitation, and procure a certain sensation of comfort.

Careful nursing is most essential.

The louse alone has been inculpated in the transmission of typhus.

A. P.

Roesler (Karl). **Die Autoserumtherapie bei Fleckfieber.**—*Wien. Klin. Woch.* 1916. Mar. 23. Vol. 29. No. 11. pp. 356–357. With 1 chart.

The author, who writes from a hospital at Troppau, has practised autoserotherapy in typhus for some time with good results. He describes three severe cases so treated. A long history of the patients is set forth. 80 to 100 cc. of blood were taken aseptically from a vein and mixed with one-tenth of its volume of 5 per cent. carbolic acid solution, being centrifuged prior to mixing. This mixture was injected intravenously, 2 to 3 cc. being used at first and then the quantity being increased by 1 cc. for subsequent injections. After two to three hours, there was a fall in temperature, and after four to six hours, profuse perspiration occurred.

The serum can be kept by being put up in ampoules. A. P.

Bouygues (Julien). **Traitement du typhus exanthématique et du typhus récurrent par l'or et l'argent à l'état colloïdal.**—*Presse Méd.* 1916. Vol. 24. Sept. 7. No. 49. pp. 391–392. With 6 charts.

During the author's work at Biserta, there was an epidemic among the Serbian troops there, 150 cases of typhus being treated in hospital. There was no installation that could be used to provide baths for therapeutical purposes; the nursing staff was small, and time was important. A communication on the treatment of typhoid fever by the use of colloidal gold suggested to the author that this substance might be of use in typhus, where the external symptoms, the prostration and general symptoms were often like those of typhoid. Ordinary antithermic reagents had been found to exercise only a symptomatic action; the results obtained by the use of salvarsan were contradictory and the anti-exanthematic serum of Nicolle and Blaizot could not be obtained. At first, colloidal silver in the form of electrargol only was obtainable; later, colloidal gold, in the form of gold collobiasis was procured and used.

Electrargol administered intramuscularly had no effect. Intravenous injections were much more efficacious. Ten cc. always was administered. In some patients a distinct, obvious action was observed half an hour after the injection. A drop in temperature of from 0·5° C. to 1° C. was found. Other patients showed no appreciable reaction, but in all cases there was an amelioration from day to day. Sleep returned, the congestion lessened, stupor disappeared, the tongue became moist, the pulse improved, and the patients at once felt better and asked for more injections. The drug modifies the temperature curve somewhat, but its antithermic action is uncertain. There is no doubt about its antitoxic action.

Gold collobiasis injections subcutaneously gave only feeble reactions. Intravenous injections, on the other hand, gave such violent reactions as to cause alarm at first. However, not the least ill effect was observed. A dose of 1 cc. of the collobiasis, or very rarely of 1·5 cc. was employed. Twenty minutes after the injection a reaction resembling a bad attack of malaria was seen. The patient shivered, his teeth chattered, sharp pains were felt all over the body, the attack lasting 20 to 25 minutes. A state of heat succeeded, with rise of temperature, sometimes up to 42° C. Then a stage of profuse sweating occurred, so that it was necessary to change the linen of the patient several times. The temperature fell from 1° C. to 2° C., and the pulse increased to 120 or 130 little by little. Pulse and temperature modifications were parallel.

In some patients the intravenous injection of gold was accompanied by frequent vomiting, sometimes persisting for four to six hours. In others there was a polymorphic erythema of a temporary nature, especially on the fore arm. Also after some injections there was a persistent tachycardia, imputed to the treatment rather than to the malady, as it was seen only in patients who had received inoculations of gold.

A strong reaction is, as a rule, preferable, and often indicates cure. If the reaction is weak, the prognosis is not good. The collobiasis always produced, from the next day, a rapid improvement in the condition, beginning about six to eight hours after injection. The treatment has not been used in cases presenting constant delirium, albuminuria, unconsciousness or grave symptoms. The insufficient

nursing staff did not permit of the treatment in cases other than those in which it seemed likely that a cure could not be accomplished spontaneously. After effects were rare; one only has been noticed, namely a feebleness of the heartbeat with cardiac weakness or myocarditis. Grave cardiac collapse has never been seen. Albuminuria existed in almost all the invalids, but was due to the generalised infection. Some of the patients were tuberculous, but the gold injections had no effect on the pulmonary lesions. The dangers of colloido-therapy have been exaggerated in the opinion of the author.

Several cases of relapsing fever have been studied. No salvarsan was available for treatment, so recourse was made to colloido-therapy. In all cases, the presence of spirochaetes was established by examination of the blood. All the patients were cured of spirochaetosis after injections of gold or silver. The reactions are the same as in the cases of typhus. The author makes no comparison between the results of the use of compounds of arsenic with those of gold or silver, but points out that the latter are of use, if the former are not available.

The author concludes that, in default of antiserum treatment, the injections of colloidal silver or gold should be used, and that this is useful where the installations do not permit the use of cold water treatments.

The charts show the effects of the treatments in five cases of typhus and in one of relapsing fever.

A. P.

von Liebermann (Theodor). **Ueber die Behandlung des Flecktyphus mit der Lumbalpunktion.** [The Treatment of Typhus by Lumbar Puncture.]—*München. Med. Woch.* 1916. May 2. Vol. 63. No. 18. pp. 657–659.

The author worked on typhus in Eastern Galicia. He has found that the removal of about 20 cc. of cerebro-spinal fluid by lumbar puncture reduced the cerebral symptoms and mostly induced somnolence, after which the rattling in the throat diminished, breathing and expectoration became normal and the livid colour of the skin disappeared. All this occurred within a few hours of the removal of the fluid.

Six cases are described, in five of which rapid recovery occurred.

A. P.

Klink (A.) & Schlesies (E.). **Fleckfieberbeobachtungen.** [Observations on Typhus.]—*Berlin. Klin. Woch.* 1916. Feb. 21. Vol. 53. No. 8. pp. 178–185. With 21 curves and 1 text-fig.

The authors have observed 134 cases of typhus, some in a war prisoners' camp and some in an isolation hospital, and have devised a new treatment. The cases selected were divided into three groups, slight, moderately severe and severe cases. The patients received digitalis at the commencement of the illness. Later caffeine and camphor were administered. The further new treatment consisted in the giving of large doses of optochin. The drug was administered *per os* in keratin pearls, containing 0·25 grams of optochin, six or eight, and then ten times daily. In this way as much as 16 to 17 grams have been

administered and no bad result has been seen. Subcutaneous injections were also used. A solution of 0·25 cc. to 1·0 cc. of optochin in 5 cc. of camphor oil was prepared, and two to three injections were given daily, each of 0·25 to 0·5 grams of optochin. For intravenous inoculation smaller quantities were employed. In severe cases, 0·3 to 0·5 grams of optochin hydrochloride were given on three consecutive days in 20 cc. of physiological salt solution.

The best results were seen in the cases with severe nervous symptoms. Nine severe, 14 moderately severe and 23 slight cases were treated with optochin, 5 were treated with quinine, and 83 in other ways. Four of the patients died, two of whom had been treated with optochin. The total mortality was low, being about 3 per cent. The duration of the fever with the use of optochin was about 12 days, but with the use of heart stimulants and baths only, it lasted 14 days.

The curves show the effect of the optochin in producing a rapid fall of temperature.

A. P.

MUNK (Fritz). **Klinische Studien beim Fleckfieber.**—*Berlin. Klin. Woch.* 1916. May 15. Vol. 53. No. 20. pp. 527–530.

The present paper gives a general account of the familiar clinical symptoms of typhus. With regard to treatment, the author advocates the use of antipyretics, of digitalis for heart trouble, and of an intravenous infusion of 300 cc. of salt solution containing caffeine and adrenalin. In convalescence the use of strychnine has been found beneficial.

A. P.

KRUSCHEWSKY. **Fleckfieberbehandlung in einem Feldlazarett während des Winters.** [Treatment of Typhus in a Field Hospital in Winter.] —*München. Med. Woch.* 1916. May 30. Vol. 63. No. 22. pp. 808–809.

The author gives an account of 32 cases of typhus observed by him in a field hospital, five of which died. He used a "combined physical and medicament treatment." The whole body was washed with water at 18° C., the temperature being raised to 40° C. if the patients' condition were bad. For diarrhoea small enemata (a wine-glassful of warm water at 22° C.) were given, or one-third of a litre of water at 49° C. with a flavouring of red wine and then "bolus alba." For heart tonics, digitalin infusion or digipuratum was given. In some cases digitalin with tincture of valerian was used. A short description of the clinical features, embodying no new features, is given.

A. P.

ZEMANN (W.). **Komplikationen und Erkrankungen im Bereiche der oberen Luftwege und des Ohres bei Fleckfieber.** [Complications in the Region of the Upper Air Passages and Ear in Typhus.]—*Wien. Klin. Woch.* 1916. Aug. 10. Vol. 29. No. 32. pp. 1014–1015.

During a period of 18 months, the author has examined 137 cases of typhus in Belgrade. The greater number were men between the

ages of 19 and 42, in all 128. Seven women were also examined and two young people aged 13 and 17. Thirty-eight cases were watched throughout the course of the disease. All had affections of the upper air passages or of the ear. Such were not surprising, since all the organs are affected severely by typhus. Typhus often begins with inflammatory conditions of the throat, fever appearing two to three weeks after these preliminary signs. During the illness when the patient lies in deep stupor and breathes through the mouth, scabs and crusts form in the neighbourhood of the larynx. With the spread of the skin rash, however, an extension of exanthematous conditions to the mucous membrane of the upper air passages and mouth has not been observed. In very severe cases, necrotic changes in the uvula and tonsils were present. Rhinitis was found in all the patients for the first four to six days.

Later, there was great reddening of the nasal mucous membrane and nasal cavities. Suppuration occurred in acute cases. The frontal regions were affected in some cases, also the ethmoid and adjacent parts. In two chronic cases, an orbital complication occurred. Necrosis of the lateral nasal bones was not seen. In a few cases there was persistent nose bleeding after convalescence had set in.

The affection of the ears was in sympathy with the condition of the nose. Inflammation of the Eustachian tube and then of the middle ear with catarrh was produced. Sixty-eight cases of affection of the middle ear were observed. In 24 cases, there was acute inflammation with perforation of the drum. Permanent injury as a result of affection of the auditory nerve has not been encountered, nor has injury of the inner ear as a result of typhus been observed in the cases examined.

A. P.

Bauer (Erwin). **Zur Anatomie und Histologie des Flecktyphus.**—*München. Med. Woch.* 1916. Apr. 11. Vol. 63. No. 15. pp. 541–542. With 3 figs.

The present paper is largely confirmatory of the findings of Fraenkel on the anatomy and histology of typhus. The author finds that the spleen is seldom enlarged, but is hard, with hyperplasia of the follicles. Typhus is characterised anatomically and histologically by systemic disease of the small, almost pre-capillary arteries. Degeneration due to proliferation and subsequent necrosis of the endothelial cells occurs.

The figures show the condition of an artery in the submucosa of the stomach, a part of the cortex of the kidney, and hyperplastic nodules in the spleen.

A. P.

Lipschuetz (B.). **Klinische und mikroscopische Untersuchungen über Fleckfieber.** [Clinical and Microscopical Investigations in Typhus.] —*Wien. Klin. Woch.* 1916. May 4. Vol. 29. No. 18. pp. 549–553. With 3 charts.

The paper opens with a discussion of the different temperature curves seen in typhus. The author considers that the typical fever lasts 18 to 19 days. On the first or second day the temperature is

38° or 39°, on the third, fourth or fifth days, a rapid drop occurs, through 38°, 37° and even to 36·4° C. A pre-exanthematic period or initial stage of two to four days precedes the true exanthematous one.

During his work, the author found bodies in the polymorphonuclear leucocytes, like those that PROWAZEK found. The structures were mostly about 0·3μ. The number varied with the stage of the disease. Out of 23 cases examined, 18 were positive, and 5 were negative. The Prowazek bodies were not found in the controls, which included cases of typhoid, variola and normal blood. The nature of the bodies may be problematic, but they may be of service for diagnosis.

A. P.

PENFOLD (W. J.). **Etiology of Typhus.**—*Trans. Soc. Trop. Med. & Hyg.* 1916. Feb. Vol. 9. No. 4. pp. 105–115. With 18 charts.

The author gives an account of his experiments on the causal agent of typhus, the results having been delayed in presentation owing to the appearance of PLOTZ'S results. An analysis of the two successive papers by PLOTZ is given and the contradictory statements contained therein are set forth. Notes on the work of WILSON, HORT and INGRAM also are given.

Four typhus cases were examined by the author. In making cultures of the blood or urine, human blood agar was the most useful medium. "The bloods and urines yielded cultures on five occasions, and they were on each occasion pure cultures of a coccus." Cultivation results after 48 hours' cultivation, of the four cases, were as follows :—Case 1, a convalescent, gave no cultures. Case 2, convalescent, yielded no blood culture but a pure coccus culture from the urine. Bloods of cases 3 and 4, plated on peptone blood agar, gave pure plates of green colonies of a coccus. Plates of urines and bloods of cases 3 and 4 on human blood agar without peptone gave pure cultures of the coccus, but without the green ring round the colonies. The cocci were arranged in pairs or tetrads and were Gram positive. Subcultures to blood agar or serum agar were positive. The organism grew at room temperature and did not liquefy gelatine. The coccus is not injured by prolonged exposure to a low temperature, 2° C. The fermentation properties of the five cultures were tested on 21 media ; all produced acid without gas. "Some time after isolation, these strains were not pathogenic for mice, rabbits or guinea-pigs."

Intraperitoneal inoculation of seven monkeys with blood from the patients was performed. Three monkeys inoculated from an acute case of typhus contracted the disease, and had "an incubation period of six days, with eight days of fever." Two monkeys inoculated from a patient at the crisis had longer incubation periods. A monkey inoculated from a nine days' convalescent had no definite fever, and one inoculated from a patient three days after the crisis had an incubation period of eleven days, and then ten days of fever with a remission. The cultures of the blood of monkeys inoculated from cases 3 and 4 gave a coccus like that obtained from the patients. Of two subinoculations of monkeys, one was positive. Two out of three monkeys inoculated with cultures isolated from patients contracted fever.

The author's summary and conclusions are as follows :—

Summary.

"1. The same coccus was found in the blood and urine of two patients suffering from typhus, and also in the urine of a convalescent of nine days' standing.

"2. European typhus blood causes the same types of fever reaction in monkeys as American and North African typhus.

"3. The coccus above mentioned has been isolated from the blood of infected monkeys.

"4. Fever has been produced after a six days' incubation by the inoculation of a pure culture of the above coccus into two monkeys.

"5. The above coccus is fairly closely related to cocci described by other authors, as far as the published data admit of a comparison.

"6. The coccus is not injured by prolonged exposure to low temperature, viz., + 2° C."

Conclusions.

"1. The actual organism causing typhus is still not fully decided, but the balance of evidence available is in favour of its being due to a coccus.

"2. The claims of PLOTZ to have discovered the cause of the disease are largely discounted by the contradictory nature of his publications.

"3. Cocci have been found in the blood so frequently by independent and competent observers, that the use of these cocci tentatively as a prophylactic vaccine appears to be indicated." A. P.

BLANC (Georges). **Recherches sur le typhus exanthématique poursuivies au Laboratoire de Nich d'avril à octobre 1915.**—*Bull. Soc. Path. Exot.* 1916. May. Vol. 9. No. 5. pp. 311–325.

The author gives an account of his experiences in the hospital at Nish at a time when the typhus epidemic was extremely severe, though on the decline. Overcrowding at the hospital was appalling. The centres of infection were the prison camps where Austrians were detained. The virulence of the epidemic was marked. Gangrene, noma, parotitis and meningeal forms abounded. The epidemic suddenly abated, benign cases became more frequent and from the end of May sporadic cases only occurred.

The experimental work showed that the typhus virus could undergo eight passages through guinea-pigs, the successive passages being indicated in a table. Twenty guinea-pigs in all were used; 13 definitely contracted typhus, one died of dysentery before the end of the incubation period, five showed an irregular high temperature that could not be interpreted, and in one case, the temperature could not be under observation. For a "normal virus" 1 gram of guinea-pig tissue was emulsified in 1 cc. of water. It was found that 22 cc. of a decinormal virus was the minimum infective dose. Attempts were made to prepare a vaccine against typhus—the work was interrupted and so incomplete. Two guinea-pigs did not contract typhus after vaccination and the control became infected, but general conclusions could not be made. Experiments on vaccine-therapy in man showed that such treatment was of most value in resistant cases. The cerebro-spinal fluid of men showing meningeal symptoms was found virulent to guinea-pigs. Examinations of the blood showed that there was a constant mononuclear leucocytosis. In contrast with the virus used by NICOLLE and BLAIZOT at Tunis [see this *Bulletin*, Vol. 7, p. 155], the Nish virus was weak and did not produce abortion of female guinea-pigs nor were the young born infected. A. P.

da Rocha-Lima (H.). **Zur Aetiologie des Fleckfiebers.**—*Berlin. Klin. Woch.* 1916. May 22. Vol. 53. No. 21. pp. 567–569. With 3 figs.

The present paper contains an account of part of the work of the author and von Prowazek at the prison war camp at Kottbus, some account of the earlier work having already appeared. The workers found that 95 per cent. of typhus lice had microörganisms, not only in their alimentary canal contents, but especially in the epithelial cells of the alimentary tract. Such bodies were never found in typhus-free lice. Similar bodies have since been obtained by the present author from typhus lice from an outbreak at Wloclawek. The lice only become parasitised by ingesting infected blood. The bodies are somewhat bacteria-like or more like the Strongyloplasmata, i.e., Chlamydozoa. They are now named *Rickettsia prowazekii.*

Rickettsia prowazekii can penetrate the cells of the alimentary canal of the louse and can multiply actively there. The organisms are very small and are shortly elliptical or olive-like. They often lie in pairs. Abnormally short or long individuals have been seen. The parasite has been found only in the leucocytes of man.

Guinea-pigs were not infected, when inoculated with lice that had fed on patients, until the fifth day. Larvae of lice have been infected from the parent louse. The excrement of infected lice has not been found infective, so far.

A. P.

Noeller (W.). **Beitrag zur Flecktyphusuberträgung durch Läuse.** [Transmission of Typhus by Lice.]—*Berlin. Klin. Woch.* 1916. July 10. Vol. 53. No. 28. pp. 778–780.

The author has carried out some work on the transmission of typhus by lice. The etiological significance of *Rickettsia prowazekii* Rocha Lima is considered no longer doubtful. The author gives some account of his own work, mingled with that of other workers, so that it is not easy to distinguish exactly what is his own work. Human body lice were found not to live long on laboratory animals and consequently the cycle of the Rickettsia was difficult to follow. The human body louse bites the guinea-pig with difficulty, and dies in about three hours if kept at 32° C. The horse-louse sucks guinea-pigs also with difficulty, but lives rather longer. The pig-louse will live on a guinea-pig for two to three days at 30° C., but will live for six days at 16° C., or at lower temperatures. Pig-lice transferred from infected guinea-pigs to pig blood lived, the Rickettsia developed in them and the pig blood was not detrimental to the Rickettsia. Human infected body lice were found capable of living and breeding on pigs. The Rickettsia developed in them normally. Eggs from three infected body lice were hatched out and the larvae raised. No Rickettsia were found in the seven larvae examined. The author has not found cases of hereditary infection so far, though he thinks such cases are possible.

A. P.

NICOLLE (Charles). **Quelques faits ou observations d'ordre expérimental relatifs au typhus exanthématique, en particulier à l'entretien du virus par passages.**—*Bull. Soc. Path. Exot.* 1916. July. Vol. 9. No. 7. pp. 487–494. With 1 chart.

During the work on maintaining the passage of the typhus virus in animals, some interesting features have occurred. They are arranged by the author in groups, according to some special character presented, and so are not connected.

Two viruses have been passed through guinea-pigs during two years. The Algerian virus has had 68 passages, 43 being through guinea-pigs, while the Moroccan virus has had 66 passages, all but the initial one through guinea-pigs; 217 animals were used, all being inoculated intraperitoneally with the Moroccan virus, 2·5 cc. to 3 cc. of blood.

The temperature curve in positive infections was typical in 182 cases, in 18 cases the infection was abortive or doubtful, and in 17 no fever was seen; 83·88 per cent. of the experiments were successful.

The first 33 passages, made in the first year of work, gave 16 negative or doubtful results out of 98. The succeeding 32 passages in the next year gave 19 negative results out of 119. The influence of the number of passages appears to be nil. Monkeys inoculated with the blood of guinea-pigs at the 9th, 16th, 21st, 34th, 42nd and 61st passage of the Moroccan virus each showed severe typhus of the classical type. The virus of the guinea-pig seems fixed. Season had a little influence. In winter (January, February, and March) 19·64 per cent. of the failures occurred; in spring, 13·11 per cent.; in summer, 13·63 per cent.; and in autumn, 17·85 per cent. During periods of extreme heat, the guinea-pigs developed typical typhus. Under the influence of the sirocco, the temperature of the animals rose. If the sirocco lasted for several days, interpretation of the temperature curves became impossible.

The incubation period of the guinea-pigs varied from 5 to 21 days, 8 to 11 days being the most usual.

The possible influence of the day of illness on which the blood was taken was also investigated, and in the positive cases, the influence on the length of incubation. The results were divided into three categories in the positive cases—(i) precocious infection—incubation less than eight days, (ii) average incubation, 8 to 11 days, and (iii) retarded incubation, over 11 days. The results are incorporated in the following table:—

	Negative.	Positive.	Early.	Intermediate.	Late.
Total ..	16·12	83·88	14·83	67·58	17·58
1st day ..	30	70	14·28	71·42	14·28
2nd day ..	15·38	84·62	11·36	75	13·63
3rd day ..	12·06	87·94	9·80	64·70	25·49
4th day ..	16·27	83·73	19·44	58·33	22·22
5th day ..	17·07	82·93	23·54	67·64	8·82
6th, 7th and 8th day ..	18·18	81·82	11·11	66·66	22·22

The duration of the incubation period does not seem to be related to the day on which the blood was taken, but to variations impossible

to estimate in the activity of the virus and in the resistance of the guinea-pig.

From experiments it was found that all organs of an infected animal were infective. The spleen was not preferable to blood for inoculation. The bone marrow had equal infective power to blood, while emulsions of the suprarenal capsules and brain seemed more virulent.

One case of intravenous and two of intracerebral inoculation o guinea-pigs have been observed. The author thinks that intracerebral inoculations will probably be of use in obtaining passages when the material for inoculation is limited.

Guinea-pigs born of parents one or both of which had been cured of typhus were found not to be immune. The immunity of a monkey once cured or recovered of typhus is doubtful.

Apart from sero-therapeutical results, the action of certain medicaments, given subcutaneously, has been tested. Pyocyanine was without action but very toxic. Formol was inactive. Salicylate of soda, either in one dose of 0·25 cgm. or daily for two to four days of 0·10 cgm. led to lowering of the temperature, but the temperature returned the day after inoculation. The drug was given to some Serbs in doses of 4 to 8 gm. per day by the mouth, but it appeared to have no effect.

A. P.

Rabinowitsch (Marcus). **Біологическія реакціи—агглютинація и связываніе комплемента—при сыпномъ тифѣ.** [Biological Reactions—Agglutination and Complement Fixation—in Typhus Exanthematicus.]—17 pp. 1916. Charcow.*

Under this title, Dr. Rabinowitsch gives the results of his researches on the complement fixation and agglutination of the serum of typhus patients, the parasites of which disease he named *Diplobacillus exanthematicus.* He also criticises the opinions of other workers on the subject.

Dr. Rabinowitsch continued his researches after having obtained from the blood of patients cultures that were very virulent, which, after numerous passages through guinea-pigs and re-sowings on artificial media, gave a clear culture yielding homogeneous suspensions of the organisms. These cultures yielded antigens of different activities, and often the same serum gave antigens of different activity. Consequently, agglutination and complement fixation experiments were made at the same time. The technique for the agglutination reaction was as follows:—For the agglutinogen, the culture from a solid medium was used. It was suspended in distilled water or in 2 to 7 cc. of normal saline, according to quantity. Three to four drops of a thick suspension of the culture from a case of suspected typhus was mixed with 1 cc. of the serum of the patient, while as controls, the same quantity was tested with the serum of patients suffering from other maladies or with normal saline. The test specimens were kept for one hour at 37° C., and then were examined under the microscope.

A table giving the results of 63 serums examined in 1913–1914 shows that agglutination was obtained in 52 cases with the Diplobacillus.

* Translated from a summary in French made by Dr. Keilin.

The results obtained in the experiments depend on the phase of the malady at which the serum is obtained. In 42 cases in which serum was obtained at the paroxysm, nine gave positive results. Five experiments made at the crisis gave three positive. Of 98 experiments made at different periods of the apyrexia 87 were positive. Comparing the results of agglutination tests with those of complement fixation, no constant agreement was found. This favours the hypothesis that each of these reactions depends on special antigens. Complement fixation reactions were made at the same time with active and inactive serum. Watery extract of cultures of the Diplobacillus were used as antigen, since extracts in ether, alcohol and acetone gave negative results. Bacilli from five different sources were sown on ascitic agar in test-tubes and kept 24 hours in an incubator. The cultures were treated with 3 to 5 cc. of sterile salt solution, according to the abundance of growth obtained. All these cultures from the same source were put in a larger vessel and kept in the incubator, and were shaken up for four days, at each half hour during the day. They were then placed in a rocking apparatus, after which the suspension of bacilli placed in sterile test-tubes was centrifuged for five minutes. An opaque liquid separated from the sediment and, added to 0·25 per cent. carbolic acid, was dissolved in physiological salt solution, and used in doses of 0·25, 0·1, or 0·2 cc. as antigen for the tests. To this antigen, diluted in 1 cc. of normal saline, 0·1 and 0·2 cc. of active serum or serum inactivated by half an hour at 5° C. were added, and the complement titrated with the antigen corresponding to the titre + 0·002 cc. Salt solution was added to the test-tubes in order to bring the level of each to 3 cc.; the tubes were shaken and left for half an hour at room temperature or for $\frac{3}{4}$ hour in the incubator. To each test-tube 2 cc. of haemolytic solution was added. This was prepared from red corpuscles of sheep, sensitised by amboceptor taken from a rabbit immunised from the sheep, and after being shaken, it was kept for two hours in the incubator, then left for an hour at room temperature, and finally put on ice till the next day. In 51 cases out of 62 examined the fixation reaction was obtained. Of these, 19 positive out of 42 were tested at the paroxysm, three out of five taken at the crisis were positive, while 81 out of 98 tested at the commencement of apyrexia also yielded positive results. Controls using the serum of relapsing fever, typhoid, tubercle, syphilis, etc. gave no fixation of complement with extracts of *Diplobacillus exanthematicus*. Also, the serum of typhus patients did not agglutinate with the typhoid bacillus, paratyphoid A and B, streptococci, etc.

While the agglutination reactions and fixation have no great practical value, as they appear only at the crisis or during apyrexia, they are of value, since they show that *Diplobacillus exanthematicus* is the etiologic agent of typhus, thereby confirming the evidence afforded by its staining reaction, its cultures, its morphology, and its pathogenic action.

A. P.

PANETH (L.). **Züchtung des** *Bacterium typhi-exanthematici* **nach Plotz, Olitzky und Baehr.** [Culture of *B. typhi-exanthematici.*] —*Med. Klinik.* 1916. June 11. No. 24. pp. 647–648.

The author states that the culture of *B. typhi-exanthematici* is not difficult but needs care. The following medium was used :—

Distilled water	3,000 grams.
Liebig's Meat extract	12 ,,
Na Cl	15 ,,
Peptone (Witte)	30 ,,
Normal sulphuric acid	17·5 cc.
(These constituents are mixed together, care being taken to prevent clotting).	
Agar	85 grams

is then added. The mixture is then allowed to stand for an hour before being incubated for two hours. It is then filtered, and a mixture of the white of eight eggs in 150 cc. distilled water is added.

Culture tubes were kept at 37° C. The earliest colonies occurred on the 5th day ; more were present on the 10th and 12th days, and some appeared up to 21 days. The colonies presented the morphology and reactions of *B. typhi-exanthematici*, and their agglutination reactions were identical.

A. P.

WEIL (E.) & FELIX (A.). **Ueber die Beziehungen der Gruber-Widalschen Reaktion zum Fleckfieber.** [The Relation of the Widal Reaction to Typhus.]—*Wien. Klin. Woch.* 1916. Aug. 3. Vol. 29. No. 31. pp. 974–978.

The authors have made some observations on the Gruber-Widal reaction in cases of typhus fever, serological and bacteriological results being in disagreement in some cases. The cases were divided into three groups. The first group included inoculated persons already possessing a positive Gruber-Widal reaction, in whom during the typhus the reaction was increased ; the second included patients in whom the reaction due to inoculation had disappeared but reappeared during typhus ; while the third class consisted of persons who had never been inoculated, yet showed a positive Gruber-Widal reaction.

With regard to inoculated persons, 15 out of 28 cases presented an increase of the serological titre, they having a positive reaction when first examined. Of the second group, 18 out of 55 patients gave a positive reaction. Of 22 cases of non-inoculated persons, four showed a positive reaction.

An increase in the serological titre was found to exist, not only in typhus, but also in such diseases as tubercle, malaria, pneumonia, and haemorrhagic nephritis. A table illustrating this increase is given.

Non-inoculated persons showed a positive reaction in 18 per cent. of the cases examined, 12 out of 67 being positive.

As a result of the investigations of the authors, it is concluded that the Gruber-Widal reaction is not specific and that its value is, in consequence, lessened.

A. P.

LOEWY (Otto). **Hautveränderungen bei Meerschweinchenflecktyphus.** [Skin Lesions in Typhus of Guinea-Pigs.]—*Wien. Klin. Woch.* 1916. May 4. Vol. 29. No. 18. pp. 547–548. With 3 figs.

The following phenomena have been seen in guinea-pigs infected with typhus:—Dropsy of the gall bladder, liver obstruction, and localised small-celled infiltration. Oedema of the urinary bladder with infiltration of the bloodvessels also occurred. Six out of 25 animals showed a rash, the spots being large, about the size of a linseed, with an ill-defined edge, rose to red in colour, with a brown or livid blue tint. The middle of the spot was dark red. Macroscopically, the spots resembled those of human typhus. The number seen in the different animals varied. Endothelial degeneration and small-celled infiltration was seen in sections of the skin of the guinea-pigs. The infiltration may be in the form of strands.

The photomicrographs show sections of the skin of the guinea-pig infected with typhus.

A. P.

PIERCE (C. C.). **Typhus Fever: Prevention and Control.**—*Texas State Jl. Med.* 1916. Aug. Vol. 12. No. 4. pp. 182–183.

This paper commences with a short outline of the history of typhus and shows that typhus exanthematicus of Europe, tabardillo or Mexican typhus, and Brill's disease are all forms of one malady, typhus. The author considers that typhus in a mild form has been endemic in Texas for years, especially in the western part of the state and along the Mexican border. Sixty-eight cases of typhus were reported to him between December 14th, 1915 and April 30th, 1916, in Texas, 40 being from the El Paso County. Almost all the cases developed in persons recently returned from Mexico. Fourteen ended fatally, ten of the fatal cases being persons above 40 years old.

The symptoms of typhus as seen in Texas are described. The author states that the description of the clinical symptoms may be somewhat different from that found in textbooks, but as similar descriptions have been printed in this *Bulletin* before [see Vol. 7, pp. 142–143] they need not be repeated.

"To prevent typhus from spreading only one thing is necessary—eliminate lice." How this elimination may be brought about is set forth in a series of "Rules to avoid typhus," which are very practical. They are as follows:—

"1. Typhus is a serious disease, giving a death-rate of from 8 to 30 per cent.

"2. Typhus is contagious, the contagion being transmitted only by lice that have bitten a person sick with typhus fever and later bite a well person. The body louse, or white louse, is the most dangerous one; more so than the head louse.

"3. As it is not possible to know which lice are infected with typhus fever, all lice should be destroyed.

"4. Persons sick with typhus are not dangerous, as spreaders of the disease, unless they have lice on their bodies.

"5. All persons should, however, keep away from one sick with typhus; in order to avoid the bites of lice, if any should be present.

"6. Convalescents from typhus are not dangerous 36 hours after their temperature returns to normal, as they then cannot infect lice, so they need not be quarantined.

"7. Avoid coming into contact with dirty persons who may carry lice in their clothing. It is unwise, therefore, to visit shows, or other crowded places or ride in street cars when typhus is present, as lice may be transferred from one person to another.

"8. It is easy to get rid of lice because they live only in contact with human beings, on whose blood they feed and in whose clothes they live and deposit their eggs.

"9. Any person that develops typhus fever should be thoroughly disinfected by having the hair cut short and the body bathed with soap and warm water or kerosene oil. All clothing should be destroyed by burning, or disinfected by boiling for at least five minutes, or by being submerged in gasoline for five minutes.

"10. All persons who are lice infested, whether sick or not, can be freed from lice by undressing and taking a bath with warm water and soap, or with gasoline, or equal parts of kerosene and vinegar. While they are undressed their clothes should be boiled for not less than five minutes.

"11. Clothing that is boiled each week will remain free from lice. Ironing clothing will also kill lice eggs that are attached to the seams and folds of the garments. A person who bathes two or three times a week and changes underclothes at least once each week, cannot become lice infested, if the clothes are boiled when they are washed.

"12. To get rid of head lice, tincture of Larkspur or Stavesacre may be used, or the head may be soaked with equal parts, kerosene and vinegar, for half hour and then washed with warm water and soap; repeat if necessary. Men and boys should have their hair clipped, after which simple washing is sufficient."

A. P.

HEYMANN (Bruno). **Beiträge zur Frage von der Beteiligung der Kopflaus an der Fleckfieber-Verbreitung.** [The Part taken by the Head Louse in the Spread of Typhus.]—*Med. Klinik.* 1916. Apr. 30. Vol. 12. No. 18. pp. 480–488.

The author states that the head and body lice are very similar but not identical insects, and gives a number of minute points of difference between them. He discusses whether head lice are concerned in the transmission of typhus fever, citing the opinions of several authorities. No final conclusion seems to have been reached.

A part of the paper is devoted to refuting the idea [now abandoned by most authorities] that typhus is a tropical malady.

A. P.

CHOLERA.

ELKINGTON (J. S. C.). **Asiatic Cholera.**—*Commonwealth of Australia. Quarantine Service Publication* No. 7.—80 pp. With 1 map. 1916. Melbourne: Government Printer.

This publication is one of a series issued by the Australian Commonwealth chiefly for the information of quarantine officers, but also of great use to anyone desiring a reliable compendium on the subject, and consists of some 59 pages divided under the following headings :—History, clinical features ,bacteriology, therapy, epidemiology, carriers, prophylaxis. The pamphlet being of a didactic nature does not discuss the relative merits of the more recent cholera media and diagnostic methods ; each section is supplied with a bibliography. A transcript of the Report of the Sub-committee on Cholera to the International Sanitary Conference of 1912 is appended, together with a list of the places infected with cholera from 1909–1914.

H. Schütze.

LEVI della VIDA (Mario). **Alcune osservazioni di profilassi anticolerica in un Ospedale militare contumaciale.** [Cholera Prophylaxis in a Military Quarantine Hospital.]—*Ann. d'Igiene.* 1916. Oct. 31. Vol. 26. No. 10. pp. 631–641.

Between 1st October and 3rd December 1915, 11,755 stool examinations were carried out in this quarantine hospital. The method chiefly relied upon was peptone water enrichment for 10–12 hours with subsequent microscopical examination for comma bacilli ; from the cultures giving positive or doubtful pictures, films were again prepared and if a positive resulted for the second time, the case was transferred to the "infected" ward ; if the film was still doubtful, a second peptone was subcultured. The author does not consider Dieudonné altogether superior to the peptone water enrichment, as it is not so simple and more easily leads to confusion in the diagnosis owing to alterations in morphology that occur with growth on the alkaline blood medium. Bandi's method is useful when a particularly rapid (3–4 hours) diagnosis is wanted.

The author isolated the vibrio in all early cases and occasionally, as a control, in later ones and carried out the agglutination test, but came at last to trust entirely to a practised recognition of the Koch bacillus under the microscope.

From 56 convalescents vibrios were isolated in :—

68 per cent. for less than 7 days.
25 ,, for 7–14 days.
7 ,, for over 14 days.

From 278 healthy persons vibrios were isolated in :—

90 per cent. for less than 7 days.
9 ,, for 7–14 days.
1 ,, for over 14 days.

The longest period of convalescent carrying was 25 days and of healthy carrying 23 days.

A point noticed was that none of those carrying for a longer period (over 14 days) was an inoculated person, but the smallness of the numbers prevented a conclusion from being drawn.

All sick or wounded soldiers coming from a cholera infected zone, and sent out of the first line hospitals because they would require more than a few days' treatment, have in Italy to pass into a quarantine hospital for at least six days.

Neither room nor equipment made it possible for an ideal system of segregation to be arranged. As cases developed among the inmates of the hospital or carriers were detected, they were sent into an "infected" ward, the actual cholera patients being segregated at one end and separated from the carriers by a barrier. When a negative bacteriological return was obtained the soldiers were transferred to an observation ward for a further bacteriological examination (perhaps two) carried out after the administration of a saline purge, and from here drafted to the ordinary military hospitals.

H. S.

de Sandro (Domenico). **Osservazioni sopra una piccola epidemia di colera.** [A Small Cholera Epidemic.]—*Ann. d'Igiene.* 1916. Oct. 31. Vol. 26. No. 10. pp. 642–646.

An account of a small epidemic apparently spreading from healthy soldiers, stationed in a theatre at Taranto and recently returned from an infected frontier, and infecting a neighbouring family. The father and daughter in this family have attacks of diarrhoea and vomiting without the cases being diagnosed; subsequently the son of seven years, becoming seriously ill with the same symptoms, is taken to hospital and ultimately diagnosed as a cholera case, an inagglutinable *V. cholerae* being isolated. Before the boy could be quarantined, the infection has spread to two other patients in the same ward.

The three cases all ended fatally and the author is inclined to see a rapid rise in the virulence of the vibrio by passage from the healthy soldier carrier through the mildly attacked father and daughter to the severely ill son and the two almost fulminant cases infected in the ward.

H. S.

de Raadt (O. L. E.). **Eenige beschouwingen naar aanleiding van de verhandeling van den heer P. C. Flu "Epidemiologische studien over de cholera te Batavia 1909-1915."** [Observations on the Paper by P. C. Flu: "Epidemiological Studies on Cholera in Batavia 1909–1915.]—*Geneesk. Tijdschr. v. Nederl-Indië.* 1916. Vol. 56. No. 3. pp. 237–243.

Flu (P. C.). **Enkele opmerkingen naar aanleiding van de "beschouwingen" van Dr. de Raadt.** [A Few Remarks on the "Observations" by Dr. de Raadt.]—*Ibid.* pp. 244–256.

De Raadt reviewing Flu's paper [this *Bulletin*, Vol. 8, p. 151] puts two questions:—(1) Is the site where cholera vibrios are conserved chiefly to be sought in the intestine of convalescent carriers or of healthy carriers? (2) Which is the best method of examining suspects in large numbers?

Citing a number of authors de Raadt declares that the important infecting agents are the healthy carriers, as only these are generally found carrying *V. cholerae* for a considerable period. He regards inoculation of great use in ridding the intestine of the parasitic cholera vibrio and advocates a modified form of BANDI's method as suitable and reliable in the examination of large numbers of people for carriers. This method consists in inoculating from the peptone water culture made with the suspected faeces, into peptone water containing agglutinating serum; agglutination goes on simultaneously with growth. With this method the author says all carriers could be detected at the ports and so prevented from landing and communicating the disease.

Flu, replying to this paper, complains that de Raadt has done no original work to support his claims, but relies upon quotations from other workers entirely; some of these authors and a number of others (KOLLE, LENZ, GOTSCHLICH, GAFFKY, etc.) are then cited in long passages to prove that he (Flu) has confirmation for his statement that convalescents may carry for many months and serve as links between epidemics.

Flu complains too that the method of quick diagnosis recommended by de Raadt is practically untested and that there is no proof that inoculation will cure the carrier condition; he cites BABES to that effect.

In conclusion Flu decides that safety from cholera infection is not to be sought as the result of a thorough search for carriers in the various shipping centres, even though it were possible to detect every carrier. The search for carriers should not be regarded as the cardinal feature of the campaign but merely as an important one. The best guarantee will always be a good and sufficient supply of drinking and bathing water (not only for the Europeans in the Dutch East Indies but for the native inhabitants as well) and a reliable system for the disposal of sewage.

H. S.

BERTARELLI (E.). **La diagnosi sperimentali del colera e le lacune del metodo ufficiale.** [The Bacteriological Diagnosis of Cholera; Defects in the Recognised Methods.]—*Morgagni.* 1916. Vol. 58. Pt. 2. Jan. 11. No. 3. pp. 43–47.

A short review in essay form of the current bacteriological methods for the diagnosis of cholera. Two questions are put, viz.:—(*a*) Can the present methods be relied upon to find *V. cholerae* in every case of Asiatic cholera; and (*b*) is it likely that *V. cholerae* may be wrongly diagnosed or, *vice versa*, non-cholera organisms diagnosed as the true Koch bacillus?

The author decides (*a*) that the cases of cholera not bacteriologically verified are very few in number and are not to be regarded as proving the present methods untrustworthy; (*b*) that an organism which is not *V. cholerae* cannot possibly succeed in masquerading as such, and that though, on the other hand, what is apparently a true Koch bacillus may not fulfil every test required of it, e.g., agglutination, still on the whole the diagnosis of cholera, as usually carried out, is sufficiently reliable.

H. S.

KAUP (J.). **Weitere Erfahrungen und Studien über den Wert und die Wirkungsdauer der Choleraschutzimpfung.** [The Value of Prophylactic Cholera Inoculation and the Duration of the Protection thus Afforded.]—*München. Med. Woch.* 1916. July 25. Vol. 63. No. 30. pp. 1093–1095.

The author runs through a number of previously published papers, showing the protective value of cholera vaccine and the influence of inoculation on the course and outcome of the disease, finding that immunity seems to be quickly (5–8 days) established.

While KOLLE considered that protection would last for a year or more, others have called his statement in question and consider even six months, laid down by Grecian authorities, too long a period, particularly if those inoculated have been through strenuous times and have not been fed or cared for too well. Reinoculation, according to these, should take place every three months, if the troops are in an infected neighbourhood.

Among the very few figures given in this paper in support of these statements are the following :—

Of 174 bacteriologically diagnosed cases, 39 per cent. had been inoculated within three months and 61 per cent. more than three months previously. [No idea is given of the total numbers of the more and the less recently inoculated, so that these figures go for nothing.] Among the more recently inoculated the case mortality was only 13 per cent., among the less recently inoculated on the other hand 40 per cent.

The author attempted to follow the bacteriolysin and agglutinin curves in a few (5–15) inoculated soldiers, in order to establish the length of time these bodies persist after inoculation, but the smallness of the numbers examined and the big individual differences make his results of little value. Complement fixation was obtained in several cases, the complement fixing bodies apparently appearing very soon after inoculation and disappearing again after 2–3 weeks in most cases, although they were still found as long as 4–5 months after inoculation in one or two cases. H. S.

ERDHEIM (J.) & SCHOPPER (K. J.). **Cholerabekämpfung.** [Anti-Cholera Measures.]—*Wien. Klin. Woch.* 1916. June 22. Vol. 29. No. 25. pp. 769–773.

As the result of observations made during the course of a cholera outbreak occurring in a camp of some 3,500 Serbian prisoners, the author comes to the following conclusions.

Hygienic measures must be rigorously enforced and inoculation immediately undertaken.

It is not to be feared that inoculation carried out during an epidemic may have an ill effect; neither the morbidity nor mortality is unfavourably influenced. One may expect the epidemic to be brought to a close 8–14 days after the last inoculation; the number of carriers should also sink rapidly to zero. If possible, the stools of all suspected persons should be examined and the carriers segregated.

To facilitate the working out of such a plan, it is advisable to group the individuals, each group to inhabit separate quarters (huts, different floors of the same building, etc.), and live entirely independently, so that examination may take place and the individuals be released from quarantine in batches. H. S.

Knopf (Eduard). **Ueber den Verlauf der Choleraerkrankungen im Gefangenenlager X.** [The Course of the Cholera Epidemic in the Prisoners' Camp X.]—*München. Med. Woch.* 1916. Aug. 15. Vol. 63. No. 33. pp. 1207–1209. With 3 text-figs.

A short account of 35 cholera cases that occurred among some 2,500 Russian prisoners arriving at the German internment camp in a collapsed condition after their difficult retreat. Within eight days the epidemic was brought to a standstill, for which the author considers isolation and measures of personal cleanliness chiefly responsible. Bolus alba and intravenous saline injections were included in the therapy, the former giving very good results. Morgenroth's preparation—isoamylhydrocupreine—was tried in a few cases but the most that the author can say for it is that he noticed no ill effects.

H. S.

Galambos (A.). **Erfahrungen über die Cholera asiatica.**—*Therap. d. Gegenw.* 1915. Vol. 56. pp. 452–456.

With an experience of some 89 cases of cholera, the author describes the usual, well known symptoms met with in the disease; the intravenous administration of hypertonic saline solution is considered the only successful therapy. Except in two or three cases the vibrios disappeared from the stools in 7–8 days; in the exceptions they were found for 2–3 weeks; whether the carriers or slight cases received Carbo animalis, Bolus alba, castor oil or no treatment at all apparently made no difference to the length of time the vibrios remained in the faeces of the patients.

H. S.

Soucek (Alfred). **Ueber das Exanthem bei der Cholera asiatica.** [The Cholera Eruption.]—*Wien. Med. Woch.* 1916. Mar. 18. Vol. 66. No. 12. p. 428.

In a cholera epidemic on the eastern front, cholera rashes were often observed. One fourth of the cases were of a urticarial nature, the remainder being like the eruption in measles. This latter type first appears on the face, spreading in 1–3 days over the body and limbs; the conjunctivae are occasionally injected but the mucous membrane of the mouth is never affected and there is no coryza or cough and no enlargement of any glands. The diagnosis as against measles was always easily made. While the urticarial type of cholera rash generally appears about the fifth or sixth day of the disease, the macular form is not usually seen until the ninth to twelfth; after three to six days the rash tends to disappear.

The author remarks on the similarity between the cholera and the serum rash and suggests the possibility of the cholera rash being due to anaphylaxis. Both slight and severe cases had the eruption, but generally the time of its appearance coincided with an improvement in the patient's condition.

H. S.

MAJUMDAR (S. K.). **Intravenous Saline in Cholera—A Contra-Indication.** [Correspondence.]—*Indian Med. Gaz.* 1916. May. Vol. 51. No. 5. p. 195.

Having noticed certain pulseless cholera cases that do not respond to intravenous saline injections, the writer suggests that in these there is no marked deficiency in the quantity of fluid in the blood vessels but that the absence of radial pulse is rather due to loss of vascular tone and cardiac weakness, the result of the toxaemia. The introduction of extra fluid into the circulatory system would in such a case only embarrass an already weakened heart. The specific gravity of the blood is therefore a better guide as to the necessity for intravenous saline injections and should the outfit for this be wanting the writer recommends the following as a test whether the veins are full or not :—" If on holding the arm just above and below the elbow, the veins at the bend of the elbow become fairly turgid on application of some extra pressure inwards (i.e., towards the bend of the elbow), the case should not be given any intravenous injection," the implication being that there is already enough fluid in the circulatory system.

H. S.

MAROCCO (Giovanni). **Agglutinazione dei germi per mezzo di sieri essiccati e dosati, con speciale applicazione alla diagnosi del colera.** [The Use of Dried Serum for Cholera Agglutination.]—*Giorn. d. R. Accad. Med. di Torino.* 1916. Mar.–Apr. Vol. 79. No. 3–4. pp. 185–190. With 1 text-fig.

The paper advocates the use of agglutinating serum dried in suitable amounts on cover slips, as a simplification of the usual method of carrying out the diagnostic agglutination test where full laboratory resources are not available, and emphasises the importance of any practitioner being able to decide without delay whether a suspected stool contains cholera organisms or not.

The coverslips supplied would have been prepared by drying on each at 37° C. one centigramme of cholera agglutinating serum so that on washing off in 10 cc. liquid, a concentration of 1 : 1,000 would result ; with 20 cc. the concentration would be 1 : 2,000 and so on.

The serum on such coverslips retains, according to the author, its titre well, if kept dry and in the dark, e.g., wrapped in blotting paper and enclosed in a metal box or glass bottle.

The method recommended is to carry out the agglutination either in peptone water inoculated with the suspected faeces or in a peptone water subculture from this and after growth has advanced as far as general turbidity. Into the peptone water tube of 10 or 20 cc., according to the serum concentration desired, a coverslip holding dried serum is dropped ; with a little shaking the serum dissolves. After two hours' incubation marked agglutination will be evident, especially in those tubes which were subcultures from a first enriching peptone water. [No idea of the limitations of this simple and apparently effective method is given and of how completely resolution of the serum dried on coverslips takes place.]

H. S.

GIBSON (H. Graeme). **A New Solid Medium for the Isolation of the Cholera Vibrio.**—*Brit. Med. Jl.* 1916. Sept. 30. pp. 454–455.

This medium consists of agar 30 grams, peptone 10 grams, starch 10 grams, and sod. bicarb. 1·5 grams, litmus, water to 1,000 cc., the starch being added after solution and clarification of the other ingredients and the litmus after sterilisation, which should be by the fractional method ; the final reaction is about –2 to phenolphthalein.

As the comma bacillus attacks starch with the formation of acid, cholera colonies growing on this medium are distinguishable from all others, except certain diphtheroids and water vibrios which also attack starch though not so rapidly, by acquiring a faint pink colour. Faeces are plated directly out on the medium and a search made for pink colonies at the end of 18 hours. [No evidence is brought as to any selective powers possessed by the medium. A somewhat similar medium, but without the addition of litmus has been advocated by LANGE [this *Bulletin*, Vol. 6, p. 499] and criticised by BOETTICHER [*ibid.* Vol. 7, p. 239].

H. S.

AZZI (Azzo). **Reazioni de vibrione de colera e di altri germi con sostanze coleranti decolorate.** [Colour Reactions of *V. cholerae* and Other Organisms.]—*Riforma Med.* 1916. Aug. 21. Vol. 32. No. 34. pp. 921–924.

The paper deals with an attempt to find a dye giving a specific reaction with the cholera vibrio.

The comparative experiments were carried out with a variety of intestinal organisms, including a number of cholera-like vibrios. [The organisms were unfortunately used in pure cultures only and no attempt was made to carry out the tests with cholera faeces, even those artificially prepared.] Of the dyes employed only fuchsin and crystal violet proved of any use.

On Aronson's medium, which contains fuchsin decolourised with sodium sulphite, *V. cholerae* and Gärtner's bacillus gave red colonies, while other organisms showed only more or less pink ones.

If, however, the fuchsin is replaced by crystal violet (0·1 cc. of a one per mille crystal violet solution decolourised with about 15 cc. 10 per cent. sodium sulphite) the colonies of *V. cholerae* and a number of other intestinal organisms take on a blue colour, while Gärtner colonies remain colourless. [Thus by using the two media *V. cholerae* should be diagnosable when in pure culture, but with an unknown mixture of colonies there would obviously be no specificity in the media].

An alternate method evolved was to plate out the organisms on ordinary agar and run over them, when grown, a few drops of colouring matter decolourised with either sulphur dioxide or sodium sulphite, observing after a few minutes which colonies recolourised the stain employed. A 0·1 per cent. aqueous solution of dye with enough 10 per cent. sodium sulphite or saturated sulphur dioxide solution to decolourise was used.

Here again basic fuchsin and crystal violet were the dyes proving useful ; the former decolourised with either sodium sulphite or sulphur dioxide coloured both cholera and Gärtner colonies red, turning others

but faintly pink; crystal violet decolourised with sodium sulphite stains *V. cholerae* and *B. coli* colonies pale blue at the periphery, but leaves Gärtner colourless.

In a mixed plate of cholera and Gärtner with a mixture of the crystal violet and fuchsin solutions (one part of the former to five of the latter) poured over it, the cholera colonies became blue and the Gärtner red. [It is not stated if *B. coli* would, as one might expect, behave similarly to *V. cholerae*.]

By observing that no recolourising powers attach to filtrates of *V. cholerae* broth cultures, but do, on the other hand, to the washed bodies of the vibrios, the author decides that the reaction obtained with decolourised fuchsin and crystal violet is not a vital process, that the bacteriological substance taking part in it is not to be found outside of the vibrio itself but intimately bound up with its protoplasm, and that as the nucleo-proteid extracted from the cholera vibrios according to Lustig and Galeotti, gives the reaction, the substance in question is in some way connected with the nucleo-proteids.

H. S.

Kuhn (Philalethes). **Weitere Mitteilung über den Nachweis von Typhus, Ruhr, und Cholera durch das Bolusverfahren.** [A Further Communication on the Isolation of Typhoid, Dysentery and Cholera Organisms by Means of Bolus alba.]—*Med. Klinik.* 1916. Sept. 3. Vol. 12. No. 36. pp. 941–942.

The method advocated consists in emulsifying the specimen, if a stool, in sterile saline and filtering through cotton wool; of the filtrate 4–5 cc. is taken in a tube and shaken with 0·02 gramme bolus alba; on standing for two minutes or so the bolus alba settles to the bottom of the tube; the supernatant is then pipetted off and the sediment after having been broken up in a couple of drops of saline is spread over a malachite green and then an Endo plate.

As microscopically it has been seen that cholera vibrios are strongly absorbed by bolus, the author expects that good results will be obtained by this method in the isolation of the comma bacillus, as has been the case with typhoid and dysentery. The author in a series of some 398 examinations found the positive typhoid diagnosis increase by 19 per cent. when the bolus method was used and in dysentery almost doubled his results.

H. S.

Lamas (L.). **Estudio comparativo entre los vibriones del cólera y los vibriones de "El Tor."** [A Comparative Study of Cholera and El Tor Vibrios.]—*Bol. Inst. Nac. Higiene de Alfonso XIII.* 1916. Sept. 30. Vol. 12. No. 47. pp. 131–163.

The author puts two El Tor vibrios received from Alexandria and two Koch vibrios through a series of tests and finds noticeable differences only in the milk cultures, in the haemolytic and the immunity reactions. The El Tor strains coagulated milk in 9 and 20 days respectively; with the choleras milk did not clot even after 30 days, though, as a certain amount of acid is produced, the author considers this difference more a quantitative than a qualitative one.

The vibrios were tested for haemolysis by growing in peptone water plus 5 or 10 per cent. defibrinated goat's or sheep's blood for as long as three days; the El Tors haemolysed, the choleras did not; however, only three years previously one of the cholera cultures had been haemolytic, which shows that the characteristic is a variable one. Using filtered peptone water cultures in the same way, the author again demonstrated the absence of haemolysis in the true cholera strains and its marked presence in the El Tors.

The serological tests carried out were agglutination, Pfeiffer's phenomenon and complement fixation.

The agglutination results were as follows :—

Cholera serum agglutinates :—

V. cholerae	$\frac{1}{4000}$ +++,	$\frac{1}{13000}$ ++,	
El Tor 3	$\frac{1}{1000}$ +++,	$\frac{1}{2000}$ ++,	$\frac{1}{4000}$ +
El Tor 4	$\frac{1}{2000}$ +++,	$\frac{1}{4000}$ ++,	$\frac{1}{10000}$ +

El Tor 3 serum agglutinates :—

V. cholerae	$\frac{1}{1600}$ +++,	$\frac{1}{7000}$ ++,	$\frac{1}{9000}$ +
El Tor 3	$\frac{1}{4000}$ +++,	$\frac{1}{11000}$ ++,	$\frac{1}{13000}$ +
El Tor 4	$\frac{1}{3000}$ +++,	$\frac{1}{10000}$ ++,	$\frac{1}{12000}$ +

El Tor 4 serum agglutinates :—

V. cholerae	$\frac{1}{4000}$ +++,	$\frac{1}{7000}$ ++,	$\frac{1}{8000}$ +
El Tor 3	$\frac{1}{2000}$ +++,	$\frac{1}{8000}$ ++,	$\frac{1}{13000}$ +
El Tor 4	$\frac{1}{3000}$ +++,	$\frac{1}{10000}$ ++,	$\frac{1}{13000}$ +

With Pfeiffer's test, each serum gives complete bacteriolysis with its homologous strain, but when crossed only incomplete bacteriolysis.

Complement fixation was made possible for the El Tor strains by heating the emulsions to 55° C. for half an hour and so getting rid of their haemotoxins.

Each vibrio was found to fix complement with its own serum even in small amounts, but *V. cholerae* did not do so with sera El Tor 3 and El Tor 4, nor did El Tor 3 and 4 as antigens fix complement in the presence of *V. cholerae* serum; on the other hand El Tor 3 could fix in the presence of El Tor 4 serum and *vice versa*, which would go to establish a group relationship between the two El Tor strains.

The author points out that as the four vibrios tested were those used in the preparation of the sera employed in the serological tests, too much stress cannot be laid on the specificity of the results obtained; it would be quite possible for instance that the cholera serum would not agglutinate a heterologous cholera strain to any greater extent than it did the El Tors.

Taken all in all the author considers that the differences between the orthodox *V. cholerae* and the El Tor strains are more quantitative than qualitative and must not be accepted as sufficient to place them in separate species.

H. S.

SCHOEBL (Otto). **Further Studies on Experimental Cholera Carriers.** - *Jl. Infect. Dis.* 1916. Aug. Vol. 19. No. 2. pp. 145–152.

A series of cholera inoculations into the gall bladder of guinea-pigs and of rabbits was instituted, with the view of establishing the condition that obtains in the artificially produced cholera carrier.

Inflammation of the gall bladder is a constant feature and in the case of rabbits of such intensity as to lead in most cases to the sealing of the gall duct. Unless this occlusion takes place cholera vibrios are to be found in the intestine for as long as they persist in the gall bladder, which in the guinea-pig was never less than 14 days.

An examination of the intestinal tract showed that cholera vibrios were almost the only bacteria to be found in the proximal part of the alimentary canal, competition with other organisms only commencing in the large intestine. In some cases the vibrios spread to the liver and appeared to have produced lesions there but, except where the animals had died shortly after inoculation, no septicaemic infection occurred.

H. S.

von KUTSCHERA (Hans). **Zur Technik der Schutzimpfung gegen Typhus und Cholera im Felde.** [The Technique of Inoculations while on Active Service.]—*München Med. Woch.* 1916. June 20. Vol. 63. No. 25. pp. 917–918.

The author warns against the dangers of merely a short boiling of the hypodermic syringe, especially in mountain altitudes; he recommends a platinum needle which can be sterilised by flaming between each inoculation. So as not to incapacitate any of his men while actually in the firing line, he inoculated smaller quantities of vaccine, giving 0·3, 0·6, 0·9 and 1·2 cc. in place of the customary 1·0 and 2·0 cc.

H. S.

CHALMERS (Albert J.) & WATERFIELD (N. E.). **Paracholera caused by *Vibrio gindha* Pfeiffer 1896.**—*Jl. Trop. Med. & Hyg.* 1916. July 15. Vol. 19. No. 14. pp. 165–175. With 1 fig.

At Port Sudan on December 14th, 1915, a Sudanese was brought into hospital suffering from intense colic and diarrhoea which had had a sudden onset the previous night and had been associated with slight cramps and vomiting; the stools were of the severe diarrhoeal, not cholera, type; a non-cholera vibrio was isolated; the patient's serum did not agglutinate either it or the Koch comma bacillus; the collapse stage was soon passed; in four days the man was convalescent; on December 24th no vibrios were to be found in the stools and on December 26th he was discharged.

The authors decided that the case was one of paracholera, the organism isolated being the causative one and this because :—

"I. It was present in the faeces in enormous numbers when the man was ill.

"II. It was absent from the faeces tested culturally when the man was convalescent."

[No mention is made of any search for other organisms possibly the cause of the diarrhoea.]

They regard the vibrio as identical with *V. gindha* which was originally found in 1891 by PASQUALE in Erythrea not far from the Red Sea Province of the Anglo-Egyptian Sudan; they also suggest that DRENNAN'S vibrio (1914), which she isolated from an Italian immigrant at New York, is the same or very closely allied and that therefore this type may be more widely distributed than is at present realised. The following comparison between *V. gindha* and the Port Sudan vibrio is given, the one point of difference between them—the atoxicity of the Port Sudan organism for guinea-pigs when given intraperitoneally—being accounted for by the suggestion that this vibrio is a less pathogenic form of the original *V. gindha* :—

No.	Character of reaction.	*Vibrio gindha* Pfeiffer, 1896.	Vibrio from Port Sudan.
1	Habitat	Water	Human intestine.
2	Length	Slightly shorter than the Cholera vibrio	Slightly shorter than the Cholera vibrio.
3	Polar flagellum	Single	Single.
4	Nitroso-Indol reaction.	Present at times	Present at times.
5	Pathogenicity Guinea-pigs subcutaneous injections.	*Nil*	*Nil.*
6	Intraperitoneal injections into guinea-pigs.	Toxic	Not toxic.
7	Intramuscular injections into pigeons.	*Nil*	*Nil.*
8	Cholera specific immunity reaction.	Negative	Negative.

The authors accepting the division of the Spirillaceae into :—

(1) the non-motile genus *Spirosoma*,

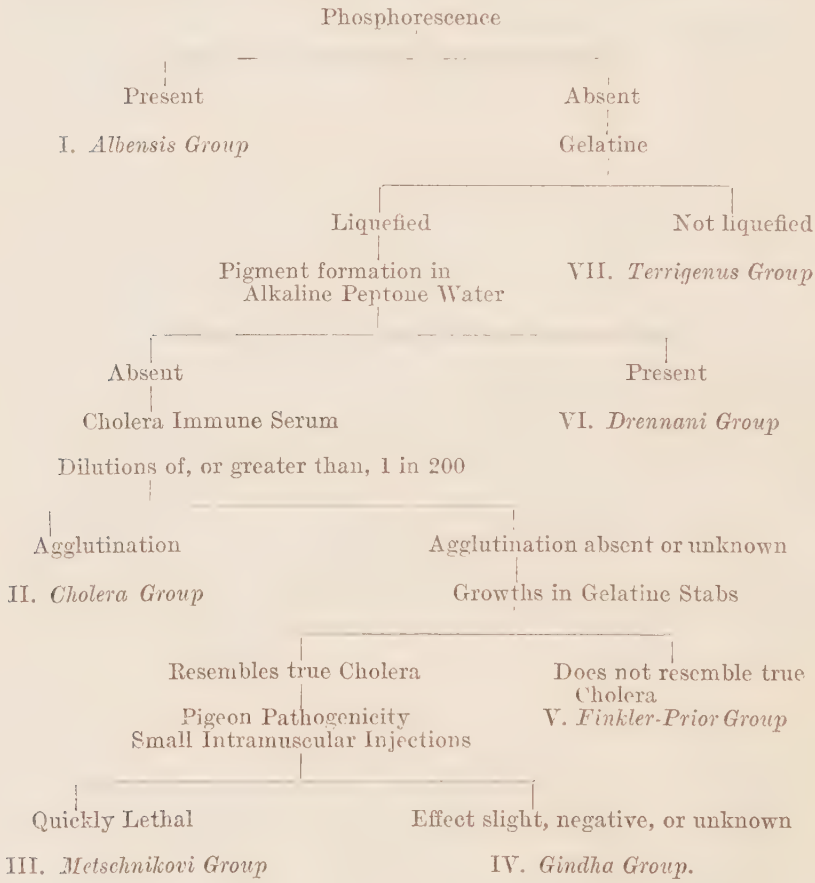
(2) the motile genus *Vibrio*,

(3) the genus *Spirillum*,

give the following table for the diagnosis of the various vibrios.

Diagnostic Table I.

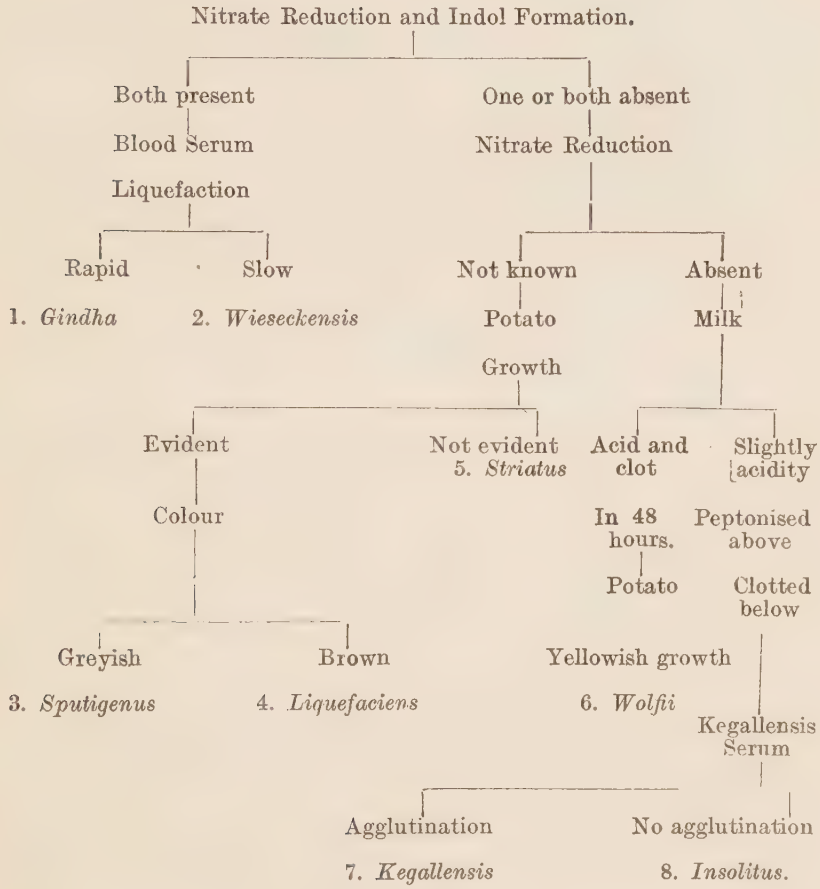
The aërobic groups of the Genus *Vibrio* O. F. Müller emendavit Löffler.



Concentrating their attention on the Gindha group, they have attempted in the second table given here to accord a place, as representative of a sub-group, to each of a number of organisms which have been mentioned in the literature from time to time, and this notwithstanding the difficulties which very incomplete descriptions placed in their way.

Diagnostic Table III.

Gindha Group.



They strongly accentuate the necessity for fuller information about the various cholera-like vibrios isolated by different workers and in order to facilitate their grouping recommend the following routine :—

"A. *General Diagnostic Characters.*

"1. Does the vibrio grow aërobically, or is it an obligatory anaërobe ?
"2. Is it phosphorescent ?
"3. Does it liquefy gelatine ?
"4. Does it produce pigment or gas ?
"5. Does it agglutinate with specific cholera serum ?
"6. How does it grow in gelatine stabs ?
"7. What is the pigeon pathogenicity ?

"B. *Special Diagnostic Characters.*

"1. Morphology.
"2. Biological characters.
"3. Cultural characters on ordinary and special media, but especially including alkaline potato and inspissated blood serum.

" 4. *Biochemical and Chemical Reactions.*
" 1. Sugars.
" 2. Glucosides.
" 3. Polysaccharides.
" 4. Alcohols.
" 5. Phenols.
" 6. Milk.
" 7. Voges-Proskauer.
" 8. Nitrate reduction.
" 9. Indol formation.
" 10. Cholera red.
" 11. Sulphuretted hydrogen formation.
" 12. Haemolysis.
" 13. Neutral red.

" 5. *Serological Reactions.*
" 1. Agglutination.
" (*a*) Specific cholera serum.
" (*b*) As many paracholera sera as possible.
" (*c*) Its own specific serum.
" 2. Absorption test.
" 3. Pfeiffer's reaction.
" 4. Complement fixation.
" 5. Action of normal human blood serum or normal rabbit blood serum.

" 6. *Pathogenicity.*
" 1. Pigeons.
" 2. Guinea-pigs.
" 3. Rabbits.
" 4. Attempts to infect animals by the alimentary canal in some way."

H. S.

MESSERSCHMIDT. **Das Vorkommen von mit Choleraserum paragglutinierenden Bakterien.** [The Occurrence of Para-agglutination with Cholera Serum.]—*München. Med. Woch.* 1916. May 30. Vol. 63. No. 22. pp. 810.

Isolating on Dieudonné's and on Aronson's media the author found, in the course of an examination of 1,000 stool specimens, some 20 non-cholera organisms (Coli, Proteus and Sarcina) which exhibited the phenomenon of paragglutination, that is to say, agglutinated with cholera serum *to titre limit*, controls put up with normal serum remaining unagglutinated.

Repeated subculture in one case carried out for four months, did not destroy this characteristic. These paragglutinating organisms were isolated from cases still carrying *V. cholerae*, from cases in which *V. cholerae* could not be found, from cholera convalescents and from healthy persons both inoculated and uninoculated.

H. S.

ŠIMIČEK (Josef). **Pemphigoides Exanthem als Folgeerscheinung der Choleraschutzimpfung.** [A Pemphigoid Eruption following Cholera Inoculation.]—*Wien. Klin. Woch.* 1916. May 18. Vol. 29. No. 20. pp. 622–623. With 2 text-figs.

An extensive pemphigoid eruption was noted by the author in a man after his second cholera inoculation, his first, as well as a previous

typhoid inoculation and a small-pox vaccination, having been undergone without any untoward symptoms.

On the evening after this second cholera inoculation, the patient had a rigor and complained of fever and headache. By the morning a vesicular eruption had appeared on the forehead and nose, later in the day spreading over the trunk. The inoculation site became red and tender.

The man's signs of nervous abnormality (tremors, nystagmus), which pointed to a probable beginning of disseminated sclerosis, might possibly have explained the eruption as being nervous in origin, but as the patient had received other inoculations previously without any disturbance the author is inclined to regard the condition as due to a hypersensitiveness following on the first cholera inoculation.

H. S.

HELMINTHIASIS.

KAKAMI. [*Paragonimus westermanii*, **Investigation of the Lung Distoma in South Ham Kyung Province, Korea.**]—*Chosen I Ho.* 1916. Feb. 1. No. 12. pp. 151–156. (Abstract based upon Review by R. G. MILLS, in *China Med. Jl.* 1916. July. Vol. 30. No. 4. pp. 292–294.

Lung distoma occurs in the province of Ham Kyung, Korea, in the middle reaches of three rivers which flow into the Japan Sea. The absence of infection in the villages along the coast is probably attributable to the tides, which affect these rivers for five or six miles inland and produce conditions adverse to the intermediate hosts. The infected district comprises about 800 miles of river valley; in the upper reaches, where the water is purer and colder, the disease is less common.

Of 471 persons examined 229 were found infected, i.e., 48·62 per cent. Of these 401 were males, of which 51 per cent. were infected, and 70 were females with a percentage of 33 infected.

The age incidence is tabulated :—

	Examined.	Infected.	Percentage.
Under 10	59	15	25
10–20	221	126	57
20–30	64	40	63
30–40	49	22	45
40–50	33	13	39
50–60	25	9	36
Over 60	20	4	20

In some villages the infection in men attains 82 per cent. Dogs in one district were said to be infected to the extent of 48 per cent. Cats are rarely kept in Korea and were not investigated. Pigs showed only 1 or 2 per cent.

Communities which took drinking water direct from the rivers were much more heavily infected than others. Those using well water escaped almost entirely. The distribution of *Melania libertina* corresponds to that of paragonimiasis in the district. The cercariae were contained in round sac-like bodies. These were at first taken to be sporocysts but Dr. MIYIRI has decided that they were rediae. Attempts to transmit experimentally the infection through the snail were inconclusive. In addition to the Pond and Fur Crab the crayfish is suspected as another possible second host.

As a preventive measure, based on the assumption that *Melania libertina* was the essential intermediary, a sanitary commission has during the last two years collected and destroyed 210 millions of snails.

The author is inclined to doubt whether crab and crayfish are actively concerned, as the dogs never eat these animals while the Koreans always cook them first.

R. T. Leiper.

EXPLANATION OF PLATES.*

PLATE I. Fresh-Water Crab.

Fig. 1. *Potamon obtusipes* (Stimpson) nov. sp., natural size.

Fig. 2. *Eriocheir japonicus* De Haan nov. sp., natural size.

Fig. 3. *Potamon dehaanii* (White), natural size.

Fig. 4. Young encysted larva in the liver of a crab (*Potamon obtusipes*). × 20.

Fig. 5. Half-grown encysted larva in the liver of a crab. × 20.

Fig. 6. Full-grown encysted larva on the gill of a crab. × 20.

PLATE II.

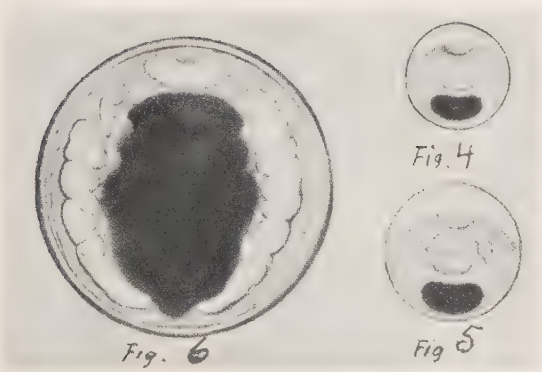
Fig. 7. Encysted larvae of *Paragonimus westermanii* in the liver of a fresh-water crab (*Potamon obtusipes*).

Fig. 8. Section through the lung of an experimentally infected puppy (No. 1) 60 days after feeding. A = passage of the worm. × 20.

Illustrating "The Mode of Infection in Pulmonary Distomiasis." NAKAGAWA (Koan). *Trop. Dis. Bull.* Vol. 8. No. 3. p. 179.

*Reproduced by permission from the *Journal of Infectious Diseases.*

PLATE I.



Illustrating "The Mode of Infection in Pulmonary Distomiasis."
NAKAGAWA (Koan). *Trop. Dis. Bull.* Vol. 8. No. 3. p. 179.

PLATE II.

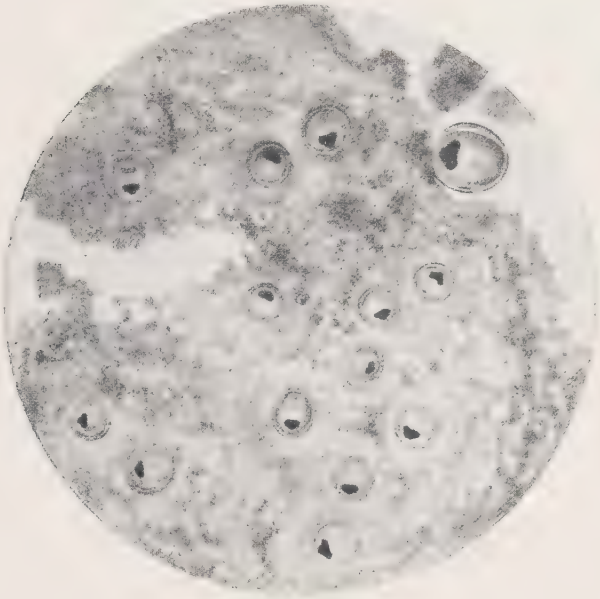


FIG. 7

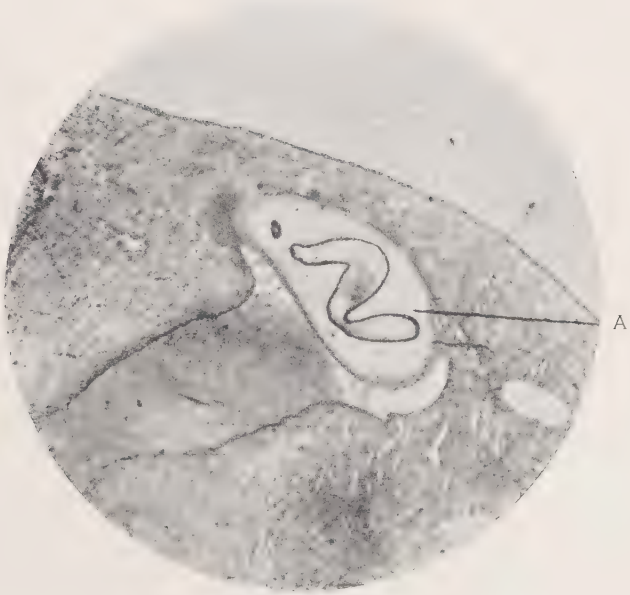


FIG. 8.

Illustrating "The Mode of Infection in Pulmonary Distomiasis."
NAKAGAWA (Koan). *Trop. Dis. Bull.* Vol. 8. No. 3. p. 179.

NAKAGAWA (K.). i. [**Paragonimus, Development of the Supposed Last Stage in the Life History of, with an Account of the Young Worms.**]—*Ju Zen Kai Shi.* 1916. Jan. Vol. 21. pp. 1–15.

ii. [**Paragonimus. First Intermediate Host the Snail.**]—*Ibid.* pp. 16–22. (Abstracts based upon Reviews by R. G. MILLS in *China Med. Jl.* 1916. July. Vol. 30. No. 4. pp. 285–287.)

A number of the chief points mentioned in Dr. Mill's abstract have already been given in this *Bulletin*, Vol 8, p. 179 in a review of a later paper by the same author.

The intermediate host has not been certainly demonstrated, but certain cercariae which appeared likely forms were found in *Melania libertina* and *Melania obliquegranulosa.* The author connects the former with *Clonorchis sinensis* and the latter must then be that of Paragonimus. A number of the snails supposed to be infected were enclosed with some crabs from a non-infected stream in a live box covered with fine gauze and submerged in a stream. In one case out of twenty encapsuled worms were afterwards found. The crabs used were *Potamon* (*Geothelphusa*) *obtusipes* [= *Thelphusa rubra*], *Potamon* (*Geothalphusa*) *dehaanii* [= *Thelphusa berardi*], and *Eriocheir japonicus* [= *E. formosa*].

The original article is reported to contain a detailed description of experiments upon seventeen dogs and cats fed on various amounts of parasite containing crab meat. The young parasites hatch in the ileum in 24–42 hours, penetrate the intestinal wall and reach the peritoneal cavity. They make their way towards the diaphragm in about 77 hours after their ingestion, penetrating it chiefly in the tendinous portion. Others penetrate the liver and ultimately reach the thoracic cavity. Very few of the worms actually reached the lung tissue. The infected animals died or were killed at intervals of from four hours to twenty-five days after feeding.

A series of measurements, based upon fixed specimens, indicate the rapidity of growth of the worms.

On release from the cysts the cercariae measure ·3–·48 mm. in length by ·18–·23 mm. in breadth. In twenty-one days these worms have attained a length of 1·3–2 mm. and a breadth of ·8–1·1 mm. After ninety days they measure 6–7 mm. by 3·4 mm. The oral spine survived until the 25th day. After three weeks the ovary and uterus were visible and the testicles began to branch. After fifty days these organs were fully developed but the yolk glands were as yet rudimentary. After ninety days eggs were produced. It is stated that the details of structure and size of the parasite are given, as the worms described have not been definitely identified as Paragonimus.

R. T. L.

YOSHIDA (Sadao). **Some Notes on the Encysted Larva of the Lung Distome.**—*Jl. Parasit.* 1916. June. Vol. 2. No. 4. pp. 175–180. With 4 figs.

The encysted larvae of Paragonimus occur in the muscles, hypodermis, gills, liver and other organs of *Eriocheir japonicus* in Japan. In the muscles the cysts are most abundant in those of the base of each appendage. It is believed that the larval cysts have a tendency to

migrate towards the gills from all parts of the body by means of the blood circulation. They can also migrate slowly through the tissues. This migration may play an important part in the transmission of the infection to the final host. The author regards it as questionable, however, whether the cysts escape from the crab naturally and actively as has been reported by other observers. The cysts found in sediment in aquaria are discharged passively after injury and breaking up of parts, from accidental injuries during moulting, or on the death of the crab. The cysts have been found to remain alive naturally in water for a relatively long period—as a result of experiments for at least thirty days under natural conditions.

In certain districts *Sesarma dehaani* happens to be the only intermediate host present. As this crab is not taken as food it follows that the infection in these localities probably results from contamination of food and water by free discharged cysts.

R. T. L.

ODHNER (T.). **Die Verwandtschaftsbeziehungen der Trematodengattung** *Paragonimus* **Brn.** — *Zoologiska Bidrag Fran Uppsala.* 1914. Vol 3.

A comparative study of the little known fluke *Distomum acutum* found in the frontal sinuses of *Mustela putorius* with the *Distomum gastrophilum* from cysts in the pylorus of *Phocaena communis*, and *Collyrichum faba* from *Sylvia hortensis* has convinced the author that these three species make with the hitherto isolated genus Paragonimus four distinct genera in a natural family, named by him *Troglotremidae*. The following are the chief characters of this new family :—More or less flattened distomes or " Monostomes," with rounded body 2–3 mm. long. The extreme posterior end is prolonged as a small appendage. Ventral aspect flat or somewhat hollowed, dorsal aspect vaulted. Skin armed with sharp spines. Musculature in those forms living in cysts is feebly developed. Gut with pharynx. Oesophagus not specially long. Gut branches end a more or less short distance in front of posterior end. Excretory vesicle Y-shaped or a single dilatation. Genital pore immediately before or behind the rim of the ventral sucker, in the middle line or slightly to the left. Cirrus usually absent. Pars prostatica and seminal vesicle always differentiated. Testes symmetrical, in or behind the middle of the body. Ovary immediately in front of testes on the right hand side and usually deeply indented. Yolk glands richly developed and also exclusively or chiefly extensive under the dorsal surface, leaving only a median streak unoccupied. Uterus long and much coiled or short and more kinked. In the former case the eggs are small, in the latter larger.

R. T. L.

MIYAIRI (K.) & SUZUKI (M.). **Der Zwischenwirt des** *Schistosomum japonicum* **Katsurada.** [The Intermediate Host of *S. japonicum.*] —*Mitt. a. d. med. Fak. d. k. Univ. Kyushu Fukuoka.* 1914. Vol. 1. pp. 187–197. With 2 plates.

Much has been written, but little is known regarding the carriers of the Schistosome worms. KATSURADA was inclined to adopt for the *Schistosomum japonicum* the theory offered by LOOSS to explain the

course of infection in *Schistosomum haematobium*, viz., a direct infection by the miracidium through the skin of man and a subsequent metamorphosis in the liver to form cercariae. TSUCHIYA however was firmly convinced that an intermediate host was essential and attempted to discover this. That he was on the right lines is shown by the discoveries of the authors, who were the first to succeed in tracing the development of this important parasite through its various stages in a fresh water snail to a free swimming cercaria and with this stage to infect a definitive host through the skin.

These researches have already been announced in various Japanese papers and were annotated in this *Bulletin* by KUMAGAWA in March, 1914 [Vol. 3. pp. 289–90]. The present paper however gives new and important details not previously available.

The intermediate host is a small dark grey coloured snail inhabiting a yellowish or brownish shell, with a right spiral and sharply conical. It is 6·7 to 9 mm. in height and 2·5 to 3·4 mm. in breadth. The coils number 8 to 8½ but in full-grown animals two or three are usually lost. The suture is deep and brownish. The operculum is horny and coils to the left. There are comb-shaped gills. The mouth cavity is furnished with a pair of jaws and a band-shaped radula of which the tooth formula is 3 + 1 + 3.

The snail belongs to the Hydrobiidae, but its further classification is left to those who specialise in this group.

Cattle manure was used throughout the experiments. The Schistosome eggs therein hatch after the dung has been mixed with rainwater. The miracidia swim about actively and, as has been described for *Fasciola hepatica*, they attack the molluscan intermediary when this is placed in infected water. After some minutes the tentacles, head, neck and mantle are bespeckled with embryos. Eventually these penetrate into the tissues and especially those of the base of the mouth cavity, around the brain and foot ganglia, and in the gills. The ciliated covering is eventually lost, but the flame cells in the excretory system survive. The miracidium now becomes a sporocyst which continually increases in size. Groups of small cells begin to form rudimentary cell balls, which become later Rediae. Over 50 Rediae may result from a single sporocyst.

The Redia may be greatly elongated or again egg shaped. It is stippled with fine points at the anterior end. The mouth is frequently widely open. There is little to be seen of the alimentary canal. The body cavity is filled with large cell and small cell balls. The Rediae crowd the liver. These extraordinarily long and much coiled Rediae tubes contain cell masses which become elliptical with a terminal knob, which is the rudiment of a tail. In these masses oral apparatus and ventral sucker are in process of formation. These eventuate in Cercariae which attain maturity after at least seven weeks.

The Cercaria has a stout tail which is split into two arms at its distal third. Body and tail are covered with fine spines. The oral apparatus is larger than the ventral sucker. In the body cavity are three pairs of large single round glands. From these long ducts lead to the rim of the mouth. Their orifices are indicated by four spines. Concerning the alimentary canal it is noted only that at the bottom of the oral apparatus there is a somewhat spacious blindsack. In the excretory system are five pairs of flame cells. Apparently cercariae

which have attained their development but have not left the host in autumn can remain until the following spring. Young Rediae are not found during the winter. The intermediate host was first implicated in August.

Infection experiments were made upon mice. Out of one hundred shells usually three or four snails are naturally infected. It was found that when not more than three mice were left in a large dish for from half to two hours with water containing at least one hundred snails these mice became infected. Mice were then submitted to infection with cercariae derived from dissection. These were also successfully infected but with much greater difficulty. Lastly infected snails were opened and left in a drop of water on a part of the skin of a mouse. The resulting infection was so severe that the mouse could not survive three weeks.

The paper is illustrated with two fine plates showing the intermediate host and the eggs, the miracidia and the various stages found in the snails. [The work appears to have been carried out during 1913. It is stated that the manuscript was completed on 25th January 1914, but there is no indication as to the date upon which the journal itself was published. It is exceedingly regrettable that this and other researches of the first importance that have been carried out by Japanese investigators should be issued in such inaccessible form.]

R. T. L.

TEODORO (G.). **Studii recenti sulla Bilharziosi umana.**—*Pathologica.* 1916. Sept. 15. Vol. 8. No. 188. pp. 285–287.

Although listed as an original communication this publication is in reality a review of three recent papers on the mode of spread and the specific nature of the parasites causing vesical and intestinal lesions. The recent paper by LEIPER on the relation of the terminal spined and lateral spined eggs of Bilharzia is quoted at length [for this see *Bulletin*, Vol. 7, p. 347]. The author also refers to two communications in the *Verhandlungen der Japanischen Pathologischen Gesellschaft* for 1914 [Vols. 48 and 51] relating to the development of *Sch. japonicum*; one from KATSURADA [Vol. 51] and the other from OGATA [Vol. 48]. Teodoro states :—

"In these the authors mention the statements of two Japanese, MIYAIRI and SUDZUKI, as having found the cercariae of *Sch. japonicum*, and OGATA in addition gives a short description of it, and a diagrammatic illustration. This cercaria has its tail bifurcated at the apex, like the cercariae of other trematodes, and the mouth is furnished with eight hooks; the acetabulum is situated close to the tail. The penetration of the cercaria through the skin has been demonstrated experimentally with animals. KATSURADA confirms the assertion of MIYAIRI and SUDZUKI, but regards the question of the intermediate host of *Sch. japonicum* as not altogether cleared up.

"For this reason, the two notes above-mentioned, being short and even dogmatic [*apodittiche*] in form, without any indication of the *modus operandi* or of the animals experimented on, oblige the judicious reader to wait for more precise data, before accepting the assertion that the cercariae penetrate the skin."

[These two Japanese papers have not yet reached this country, nor have they appeared hitherto as titles in lists of references available at the Bureau.]

J. B. N.
R. T. L.

KOIKI (G.). **[Investigation of Patients infected by** *Schistosomum japonicum.*] *Saikin Gaku Zasshi.* 1916. Apr. 1. No. 246. pp. 523–530. (Abstract based upon Review by R. G. MILLS in *China Med. Jl.* 1916. Sept. Vol. 30. No. 5. p. 380).

In the villages around Shushin adjoining the east coast of Japan the author examined 1,077 persons. Of these 42 were found infected with *Schistosomum japonicum.* All but three of the cases were farmers. Only 22 realised that they were not in good health. Ten had enlarged livers and twelve felt tenderness on pressure. It is said that " most of the patients remembered having had an itchy eruption on the legs about a year previous, but recalled no constitutional symptoms."

R. T. L.

LEIPER (R. T.). **i. Report on the Results of the Bilharzia Mission in Egypt, 1915. Part IV.—Egyptian Mollusca.** Based largely upon a typical set partly collected and arranged by J. Gordon THOMSON.—*Jl. Roy. Army Med. Corps.* 1916. Aug. Vol. 27. No. 2. pp. 171–190. With 30 figs.

ii. Observations on the Mode of Spread and Prevention of Vesical and Intestinal Bilharziosis in Egypt, with Additions to August, 1916.—*Proc. Roy. Soc. Med.* 1916. July. Vol. 9. No. 9. (Occasional Lectures.) pp. 145–172. With 25 text figs.

i. The previous reports were summarised in this *Bulletin,* Vol. 6. p. 437, and Vol. 7, p. 345. The present instalment consists of a list of Egyptian molluscs, with figures, and an addendum on army prophylaxis. Dr. Leiper writes :—

" The larval metamorphosis of all digenetic trematodes occurs without known exception in the bodies of molluscs belonging to the classes Gastropoda and Lamellibranchia. . . .

" The large majority of trematode larvae develop in the Gastropoda. The Gastropoda are specially characterized by a univalve shell, an asymetrical organization and a well developed head, while the Lamellibranchia have a bivalve shell, an internal and external symmetry and a rudimentary cephalic region."

A classification table is given of these two classes, followed by the names and locales of the Egyptian species with figures from two or three aspects ; in every case, it is stated, the diagnosis is provisional. The species of present importance are *Planorbis boissyi, Bullinus contortus, B. dybowski* and *B. innesi. P. boissyi* appears to have a limited distribution in Lower Egypt but a wide distribution in the Sudan. It has been recorded on several points of the White Nile from Abba Island to the Bahr-el-Zaraf. It is the intermediate host of *Bilharzia mansoni* in man in Egypt [see figure, this *Bulletin,* Vol. 7, p. 346]. *B. contortus* [fig. *loc. cit.*] is found in the irrigation canals, usually associated with *B. dybowski.* It has been reported from " North, West and South Africa, Abyssinia, the Euphrates, and South Europe." It and *B. dybowski* are intermediate hosts of *Bilharzia haematobium* (*sens. strict.*) in man in Egypt. *Bullinus innesi* on some occasions was found infected with cercariae of *Bilharzia haematobium* (*sens. strict.*). Not much seems to be known of the distribution of this mollusc. A table is given of " Egyptian molluscs in which trematode larvae occur."

In the spring of 1916 "further experiments were made . . . to determine the degree of protection afforded by a modified Jewell system of filtration, which it was proposed to instal at various points on the Sweet-Water Canal." In this system alum is added in a settling tank, prior to filtration through sand about a metre in depth. This provides six possible traps for the Bilharzia cercariae. It was found that the cercariae eluded all the traps and were active after traversing thirty inches of sand. The efficacy of such mechanical systems, therefore, depends solely on the delay interposed "between the discharging mollusc and the consumer." Chemical sterilisation, as stated in a previous summary, is effected either by two 1 gm. "tabloids" acid sodium sulphate dissolved in a quart of water or two parts of available chlorine in a million. Boiling is of course also effective. It is found further that ablution water is easily rendered quite safe by the addition of "ordinary Army Cresol" 1 in 10,000.

Full acknowledgment is made of the assistance for varying periods of Drs. Cockin and J. Gordon Thomson and of Mr. W. McDonald.

ii. This publication, based on a lecture given in July 1915, forms a summary of the author's work in Egypt, which has been set out in detail in previous papers, one of which is summarised above and the rest in previous numbers of the *Bulletin.* Several illustrations are reproduced. A. G. B.

Cawston (F. G.). **Report on the Examination of 1,000 Molluscs in Natal.**—*Med. Jl. S. Africa.* 1916. June. Vol. 11. No. 11. p. 197.

An examination of 1,000 different specimens of molluscs found in stagnant pools and in the slow running streams of Natal was made during April, May and June. These were diagnosed by Mr. Burnup of Maritzburg as follows :—

Isidora forskali	3
Isidora tropica	50
Physopsis africana	522
Ancylinae	20
Planorbis leucheilus	a few
Planorbis pfeifferi	228
Limnaea natalensis	184

"Tadpole" cercariae or cercariae possessing an undivided tail occurred in 29·1 per cent. of *Planorbis pfeifferi.* "There were several varieties of these cercariae present." "Bilharzia forms of cercariae" were present only in *Physopsis africana* in 17·4 per cent. The author now finds that there are several forms of cercariae [in *Physopsis africana*] in Natal which answer to the description of the Bilharzia group in Egypt and the Far East. One had eye spots, one had very long prongs to the tail and occurs apparently only in the Umsinduzi River, a third is present in 15 per cent. of the *Physopsis africana* found in the Durban brickfields. All experiments upon animals have so far proved negative.

[The use of the term "Bilharzia forms" for cercariae with bifid tails is exceedingly misleading. The presence of a bifid tail is no indication that a cercaria belongs to any special systematic group. In Egypt 9 out of 27 recorded species of cercaria have "bifid tails."]

R. T. L.

CAWSTON (F. G.). **The Cercariae of Natal.**—*Jl. Trop. Med. & Hyg.* 1916. Sept. 1. Vol. 19. No. 17. p. 201.

So far sporocysts containing cercariae with bifid tails have been found in South Africa in *Physopsis africana* only. The liver of this snail when infected is yellowish; when the "sporocysts" contain tadpole forms the liver is more often orange coloured. "The cercariae met with at the coast are larger than those found at inland towns; most show an absence of pharynx but occasionally one comes across a sporocyst containing cercariae with bifid tails and a muscular pharynx." The author finds that "until the cercariae are fully developed it is impossible to differentiate the distinctly human form from the other common forms of cercariae with bifid tails." It would seem that human cercariae are present in about five per cent. of the specimens of *P. africana* found in the freshwater bathing places.

The author tabulates his results for April and May as follows: –

		Healthy.	With "tadpole" forms.	With bifid tails.
April ..	*P. africana*	159	13	30 (5 distinctly human forms).
	Limnaea natalensis	87	2	—
	Planorbis pfeifferi	17	7	—
May 1–15	*Physopsis*	174	7	34 (11 distinctly human forms).
	Limnaea	54	3	—
	Planorbis	110	53	—

[It is difficult to make out to what extent these figures are included in those quoted in the preceding note. The text is illustrated with seven figures of cercariae, and one figure with two "suckers" is described as a "sporocyst showing escaping cercariae."]

R. T. L.

BUTLER (G. G.). **Some Observations made on apparently Healthy Boys at the Bo School for the Sons of Chiefs.**—*Sierra Leone Ann. Rep. on the Med. Dept. for Year ended 31st Dec., 1915.* pp. 26–29.

Seventy-five scholars of the Bo School were examined in November and December 1915. In 20 out of 75 cases Bilharzia eggs were found microscopically in the urine. The majority of the infections occurred in boys of the tribes Kissy, Mendi and Konnoh. No cases at all occurred among the Timnee boys and from enquiry it appears that while the Konnoh district is a country of many permanent streams, the Timnee district is almost completely dried up during the dry season.

The Kennema district is infected with Bilharzia and the streams surrounding this town are swarming with snails, which to the author appear to be similar to the snail that has been recognised as the intermediary host for the human Bilharzia of Egypt. In some cases of Bilharzia infection there was no sign of cystitis although living ova were found in the urine, and its presence seemed to give no trouble

whatever to the host. The Mendi name " Kanye " is used to describe equally gonorrhoea and urinary bilharziasis, but a white variety or gonorrhoea proper is distinguished from a red variety which is actually the result of urinary Bilharzia. Hitherto Bilharzia infections have always been regarded as rare in Sierra Leone.

R. T. L.

ATKINSON (E. L.) **An Expedition to the Far East to investigate the Spread of Trematode Diseases, with Special Reference to** *Schistosoma japonicum*, and **with a Note on Some Protozoa as Causes of Dysentery.**—*Jl. Roy. Nav. Med. Serv.* 1916. Oct. Vol. 2. No. 4. pp. 485–490.

This report gives a brief account of the itinerary followed on the occasion of a visit to the Far East with the Wandsworth Scholar of the London School of Tropical Medicine in 1914. The helminthological results are briefly summarised from the Report of the Advisory Committee Tropical Diseases Research Fund, already annotated in this *Bulletin* [Vol. 6, p. 295].

R. T. L.

JOYEUX (Ch.). **Sur le cycle évolutif de quelques Cestodes. Note préliminaire.**—*Bull. Soc. Path. Exot.* 1916. Oct. Vol. 9. No. 8. pp. 578–583.

In this contribution the author confines himself to the biological results of experimental studies on the transmission of *Dipylidium caninum*, *Hymenolepis diminuta* and *Hymenolepis nana*. The morphological details will appear in a separate memoir.

As is well known *Dipylidium caninum* has, as intermediate hosts, *Trichodectes canis*, *Ctenocephalus canis* and *Pulex irritans*. From an examination of sections of the proboscis the author concludes that the eggs of the tapeworm cannot be sucked up by these fleas. The flea larvae however readily swallow the eggs. In the intestine these eggs hatch and the embryo tapeworms quickly migrate into the general body cavity of the flea larva where they remain until the insect metamorphosis is complete.

The researches of GRASSI and ROVELLI implicating *Asopia farinalis* and *Anisolabis annulipes* in the spread of *Hymenolepis diminuta* are fully confirmed. Attempts to infect *Forficula auricularia*, *Periplaneta orientalis* and *Blatta germanica* were unsuccessful. *Blaps mortisaga* similarly proved immune. *Tenebrio molitor* was readily infected but in the adult stage only. Success attended experimental infections of *Ceratophyllus fasciatus*, *Xenopsylla cheopis*, *Pulex irritans* and *Ctenocephalus canis*, but with larvae only.

Rats were readily infected by feeding with infected specimens of these various insects.

Hymenolepis nana is a frequent parasite of man, especially in childhood; its identity with *Hymenolepis murina* in the rat is still uncertain. The author considers that the differential characters described by von SIEBOLD and others are much exaggerated. The transmission of the rat tapeworm is direct, as recorded by GRASSI. The experiments were easily repeated. Infection followed the ingestion of eggs in a large series of rats and mice. The cysticercoid developed

in the intestinal villi as observed by the Italian investigator; MINCHIN and NICOLL and, later, JOHNSTON have stated that they have found the cysticercoid of this species in the body cavity of *Xenopsylla cheopis* and *Ceratophyllus fasciatus* but the author has repeatedly failed to induce infection experimentally in these and other fleas.

It was hoped that experimental infection of rats with eggs from cases of *Hymenolepis nana* in man might afford material for a detailed comparison of this species with *Hymenolepis murina*, but experimental difficulties which supervened have not yet been wholly overcome.

R. T. L.

BLANCHARD (R.). **Tête de** *Davainea madagascariensis.—Bull. Soc. Path. Exot.* 1916. July. Vol. 9. No. 7. p. 413.

In a brief notice accompanying the presentation to the Society of Tropical Pathology in Paris of drawings of five specimens M. Blanchard gives some new facts regarding this rare parasite of man. Not only is the rostellum armed but the suckers also are provided with hooks. These number about 110 and are arranged on at least five concentric rows.

R. T. L.

LANE (Clayton). *Hymenolepis nana.* [Correspondence.]—*Indian Med. Gaz.* 1916. Aug. Vol. 51. No. 8. p. 314.

With reference to the note on *Hymenolepis nana* in the *Indian Medical Gazette* for June [this *Bulletin*, Vol. 8, p. 192], Major Clayton Lane writes pointing out there are on record earlier cases of the occurrence of this parasite in India than that cited, viz., by LANE in *Indian Medical Gazette* for 1904 and 1909, by JONES in 1910, while Col. BANATVALA had reported also the eggs in a patient in the Nagpur Lunatic Asylum.

R. T. L.

BETTENCOURT (A.). **Casos de infestação pela** *Hymenolepis nana* **em Portugal.** [Cases of Infection by *Hymenolepis nana* in Portugal.] —*Med. Contemporanea.* 1916. June 18. Vol. 34. No. 25. p. 193.

Referring to a recent communication by MACHADO on the occurrence of *Hymenolepis nana* in Portugal, the author recalls that he recorded a case in a communication to the Portuguese Society of Natural Sciences on March 17th, 1915. Details are also given from a forthcoming paper by Senhora D. Isaura PAIO, which show that, out of 503 cases of children examined for the purpose, 33 revealed the presence of ova of *H. nana*, either alone or associated with the eggs of nematodes. From this it would appear that *H. nana* is the commonest Cestode in Portugal, as it is in Italy and Sicily, where GRASSI found it in 10 per cent. of children belonging to the poorer classes.

J. B. N.

ANCONA (Arrigo). **Per un nuovo caso di elmintiasi da** *Dipylidium Caninum* **nell'uomo.** [A Case of Infection by *Dipylidium caninum* in the Human Being.]—*Riforma Med.* 1916. June 12. Vol. 32. No. 24. pp. 652–655.

A case of infection by the common dog tapeworm in a female child aged five years. Itching of the anus was observed, and the child was found to be passing proglottides of a tapeworm which was recognized as belonging to the species mentioned. A vermifuge of 2½ grammes of ethereal extract of male fern, and one gramme of Kamala, was given, which procured the expulsion of fragments of tapeworm measuring in in all 50 centimetres, so that there were probably several worms present. A cat with which the child had been in the habit of playing was found to be infected with the same tapeworm.

The author remarks that there are now on record 72 cases of this infection in man: the greatest number being reported from Denmark and Germany. A bibliography of recent memoirs on the subject is appended.

J. B. N.

MENDOZA-GUAZON (Maria Paz). **A Case of Infestation with** *Dipylidium caninum.*—*Philippine Jl. Sci.* Sect. B. Trop. Med. 1916. Jan. Vol 11. No. 1. pp. 19–31. With 3 text figs.

Four chains of melon-seed-like tapeworm segments were obtained post-mortem from the upper part of the ileum of a male child eight months old. A very full account of the autopsy is given. No eggs were found in the faeces. There is no previous record of the occurrence of *D. caninum* in the Philippines, but BOWMAN (1910) suspected that the Igorots in Benguet subprovince might be infested with this parasite owing to the fact that dog meat is one of their constant foods. Although these dogs are infected with *D. caninum* and the fleas *Pulex serraticeps* and *P. irritans* occur in that region, he did not find eggs of *D. caninum* in 100 stool examinations.

In one of the parasites only was a head and neck found—this was buried in the mucosa. In this strobila, which measured 48 mm. long and had about 40 segments, the head was small and rhomboid and showed a retracted rostellum with four rows of alternating rose-thornlike hooklets. The largest segment was 3 mm. long by 1 mm. in breadth after staining. The strobila, head and posterior segments are carefully delineated.

The absence of the parasite in man in the Philippines is attributed to:—

(1) Filipino children are not fond of playing with dogs and cats:

(2) Puppies are fed on soft boiled rice, not milk, and in a separate bowl;

(3) Babies are almost always breast-fed;

(4) Babies are left in hammocks, not on the floor, and are thus little in contact with dogs and cats;

(5) Although some tribes eat dog meat they burn off the hair before removing the skin.

R. T. L.

da MATTA (Alfredo A.). **Os nematoides do tubo digestivo de que modo infestam o organismo ? Prophylaxia.** [By what Channels do the Nematoids of the Alimentary Canal enter the System ? Prophylaxis.]—*Brazil Medico.* 1916. Apr. 15. Vol. 30. No. 16. pp. 121–124.

An occasional article recounting the various ways in which the alimentary canal of the human being in the tropics can become infected with nematoid worms ; bare feet, flies, primitive sanitary arrangements, and the custom of manuring gardens and fields with human dejecta being the principal. The usual methods of prevention as given in recent text books are tabulated at the end. J. B. N.

RANSOM (B. H.). **The Occurrence in the United States of Certain Nematodes of Ruminants transmissible to Man.**—*New Orleans Med. & Surg. Jl.* 1916. Oct. Vol. 69. No. 4. pp. 294–298.

The author draws attention to the common occurrence in the United States of twelve species of Trichostrongylus. Three of these, viz., *T. vitrinus*, *T. probolurus* and *T. colubriformis* (= *T. subtilis*) have been found in man as occasional parasites in other parts of the world.

The absence of records of these forms as parasites in man in the United States is probably due to the fact that in man as a rule they occur in small numbers only and are very slender and difficult to detect. Their eggs are of large size but somewhat similar to the eggs of ankylostomes. As JIMBO (1914) found *Trichostrongylus orientalis* in Japan in 27 out of 57 post-mortems and had in addition five patients who were infested with this parasite one is lead to suspect that the trichostrongyles are not such rare parasites in man as is generally supposed.

Haemonchus contortus is another very common parasite of ruminants whose presence may be anticipated in man on the strength of the report of a case in Brazil by MAGALHAES in 1908.

[It is strange that these various parasites have not been reported by the United States Hookworm Commissions.] R. T. L.

STEWART (F. H.). i. **Further Experiments on Ascaris Infection.**—*Brit. Med. Jl.* 1916. Oct. 7. pp. 486–488.

ii. **The Life-History of** *Ascaris lumbricoides.* [Correspondence.]—*Ibid.* Sept. 30. p. 474.

i. In the *British Medical Journal* for July 1st, 1916, the author showed [see this *Bulletin*, Vol. 8, p. 197] that when mature Ascaris eggs were fed to mice larvae were found in the lungs and liver. A further series of twelve experiments is now reported. In these the larvae of *Ascaris lumbricoides* and *A. suilla* were found to appear in the bronchi, trachea and mouth of the mouse and rat on the night of the seventh day and during the eighth day after infection. None appear in the respiratory tract later than this. These larvae cannot live in tap water but can survive for twenty-four hours on damp bread and for forty-eight hours in rat's lung. The author is of opinion that these experiments strongly suggest that man is infected by contaminated food and he believes " they [larvae] will be found to emigrate actively in the saliva on to the food which is being nibbled by the rodent."

To four mice were given eggs of *Ascaris marginata* and in three, larvae were found in the liver.

The Ascaris larvae found in the lung were but a small percentage of those administered in eggs. From the average dose of 5,000 eggs certainly not more than 50 larvae, i.e., 1 per cent. were recovered from the lungs.

The larvae bore into the venules of the portal system or ascend the bile duct. They occur in the dilated capillaries of the liver between the second and fifth day but as they have a diameter three times that of a red blood corpuscle they cannot pass through a normal capillary. The liver cells around the larvae undergo rapid degeneration and the larvae are thus able to work their way into the hepatic venules, and thence by the vena cava to the lungs. Here embolism of the arterioles occurs and the larvae pass with the effused blood into the air vesicles.

Attempts were made to infect five pigs by feeding them with Ascaris larvae in the lungs of mice. Two of the experiments proved negative; in one there was a single female Ascaris, in another two females and four males, while in the third three males and twelve female Ascaris were found. These experiments, it is said, " tend to prove that the larvae from the lungs of rodents can infect the pig and it is probable that in nature infection of man and the pig takes place by food contaminated by rats or mice."

Ripe eggs of *Ascaris marginata* and *Ascaris mystax* were also administered to a pig with negative results.

ii. Captain Stewart writes to say that an editorial in the *British Medical Journal* dealing with his researches on Ascaris development makes no reference to his theory " that the rat and mouse are intermediate hosts in the life history of *Ascaris lumbricoides*," but that another theory is advanced. He is of opinion that sufficient weight has not been given to his recorded experiments on pigs. The theory that the Ascaris passes through the lungs of the same host as that in which it attains full maturity he rejects as untenable.

R. T. L.

LANE (Clayton). **The Genus Ancylostoma in India and Ceylon.** — *Indian Jl. Med. Res.* 1916. July. Vol. 4. No. 1. p. 74.

The author brings together in this paper a very useful series of descriptions and illustrations of the members of the genus Ancylostoma hitherto found in India. Two of these, *A. duodenale* and *A. ceylanicum*, occur in man. *A. ceylanicum* and *A. caninum* are common in dogs, while *A. malayanum* has been found only in the Malay bear. Certain emendations in the accepted descriptions of the last named parasite are justified on the basis of the new researches recorded.

In the discussion on *Ancylostoma ceylanicum* it is recalled that this parasite was first named and described from a Ceylon civet by Looss in 1911 and was first observed by the author as an occasional parasite of man in 1913. It has since been recorded from Siam. Dr. DARLING writes from Kuala Lumpur that he also has found this species twice, once in a Tamil and once in a Chinese and that the dogs " are full of them." On the controversy regarding the identity or otherwise of this ankylostome with *A. braziliense*, Lane says " although the description by Looss of the character of the bursal rays probably definitely settles

the non-identity . . . it does not, any more than does the description of de FARIA, give any real help in settling whether a fine rayed *Ancylostoma* subsequently found by some other observer is *A. braziliense* or some allied species; nor does it enable its natural affinities within the genus to be fixed."

In regard to the oral capsule it is observed that with the three-toothed type of mouth armature there is associated a different type of arrangement of the bursal rays from that found with the two-toothed type. This is used to subdivide the genus into two subgenera (*a*) *Ancylostoma* (*Ancylostoma*) *duodenale* type and *A.* (*A*) *caninum*, (*b*) *Ancylostoma* (*Ceylancylostoma*) *ceylanicum* type and *A.* (*C*) *malayanum*.

R. T. L.

TIJSSEN (J.). **Oleum chenopodium en ankylostomiasis.** [Oil of Chenopodium in Ankylostomiasis.]—*Geneesk. Tijdschr. v. Nederl. Indië.* 1915. Vol. 55. No. 4. pp. 450–457.

A paper confirming VERVOORT's experience with regard to Oleum chenopodii as a vermifuge [see this *Bulletin*, Vol. 3, p. 297]. The author finds it quite as good as thymol, when given in three successive doses of 16 drops for each dose. This, however, will not in any case procure the expulsion of more than 60 per cent. of the worms present, the remainder necessitating a second treatment. For VERVOORT's method of evaluating the precise value of a vermifuge in terms of the percentage of worms which it expels, see his original paper, as above.

J. B. N.

RANSOM (B. H.). **Effects of Refrigeration upon Larvae of *Trichinella spiralis*.**—*Jl. Agric. Res.* 1916. Jan. 31. Vol. 5. No. 18. pp. 819–854.

In an earlier article in 1914 it had been shown that contrary to generally accepted views low temperatures have a very pronounced effect upon the vitality of trichina in infected pork. These results have been confirmed and extended.

Four hundred pounds of trichinous meat were frozen and kept below the freezing point of water for varying periods from a few minutes to fifty-seven days. On removal from the freezer the meat was allowed generally to thaw slowly at ordinary room temperature. A portion was chopped or ground into fine pieces, placed in an artificial gastric juice and incubated at 38° to 40° C. overnight and then washed and sedimented. The trichinae were found isolated from their capsules in the sediment and were studied as regards activity, etc., on a warm stage.

After exposure to a temperature of about 15° F. for 23 days trichinous meat has proved to be infective, but this temperature is injurious to the worms and such meat frequently fails to give a positive result in test animals. A temperature of 10° F. is more injurious but again the effects are uncertain. After 14 days of exposure the degree of infection is, at best, slight and is *nil* after 20 days.

Apparently 10° F. is "a critical point below which the effects of cold become suddenly much more pronounced." At 5° F. only a very small proportion survive more than five days and the risk of infection is very slight.

Below 5° F. protoplasmic changes are evident.

Rapidity of freezing and thawing produces no appreciable effect.

The author concludes that trichinous meat should be refrigerated at a temperature not higher than 5° F. and for not less than 20 days.

R. T. L.

THÉZÉ (J.). **Pathologie de la Guyane française. (Lèpre, Filariose, etc.). Rapport sur les Travaux de l'Institut d'Hygiène et de Bactériologie 1914-1915.**—*Bull. Soc. Path. Exot.* 1916. July. Vol. 9. No. 7. pp. 449–469.

Like leprosy, elephantiasis is very widespread in French Guiana. One sees all the various manifestations of filariasis such as chyluria, hydrocele, chylous ascites, lymphscrotum and lymphadenoma. Even Europeans are not exempt.

Out of 133 patients in hospital 37 showed *Microfilaria nocturna* in the blood at night. The blood was taken once only and twenty-four of the patients were suffering from advanced elephantiasis, so that the incidence of filarial infection is probably higher than 28 per cent. The *Microfilaria demarquai* was met with three times.

In a woman of about 50 years of age, suffering from slight lymphadenoma, an abundance of clear lymph discharged periodically from two small non-ulcerating tumours situated in the right groin. Floating in this fluid were small flakes of albuminous appearance. Under the microscope these proved to be masses of microfilariae. Similar filariae were found in the husband and daughter of the patient. When seen fresh the microfilaria progressed easily. It measured from 280μ to 305μ long and had a breadth of only 7μ. There was no sheath, the caudal extremity was very slender. The embryo never appeared in the blood.

After staining with Giemsa the length was only 270–290μ. The "spots" appeared (1) at the cephalic extremity, (2) at 24·1 per cent. of the total length, (3) extending from 30·4 per cent. to 35·6 per cent. of the total length, (4) at 58·29 per cent., and (5) inconstant at 79·1 per cent. of body length. All the characters of this embryo, like the lesions associated with it, bring it into nearer relation with *Microfilaria volvulus* than with other known forms in man.

R. T. L.

LAVERAN (A.). **Sur un cas de filariose due à *F. loa* d'une durée de 14 années.**—*Bull. Soc. Path. Exot.* 1916. July. Vol. 9. No. 7. pp. 436–438.

The patient upon whom these notes are based visited Ogowé in the French Congo in 1899, where he remained for some months. In the same year he was invalided home with dysentery but returned in 1900 and spent eight months in the Forest. He was again invalided and remained in France for eighteen months. In March 1901 a Filaria was noticed in the eye for the first time. Next year a surgeon unsuccessfully attempted to extract a worm from the left eye. The blood was examined at this time but no microfilariae were found.

Between 1903 and 1906 the patient visited Senegal twice. The worm presented itself in one or other eye at intervals of not less than two months and mostly during the night.

In 1907 a voyage was made to the Sudan. After eight months the patient returned to France. Between 1907 and 1909 the worms appeared under the conjunctiva at least twice. In 1909 a female worm about 6 cm. in length was extirpated and another adult was removed in Senegal in the following year. A third worm was excised during the winter of 1912 at Algiers. Microfilariae were noticed more or less commonly in the blood at various times from 1911 to 1913. In December 1914 a small male was seen to be followed by a female and the patient writes that the filaria worms for some years past have shown themselves in pairs, the male following the female at a few moments interval. Since 1914 neither adults nor embryos have been detected.

R. T. L.

FAMULARI (Sebastiano). **Il primo esempio autoctono di Filariosi in Sicilia.** [The First Indigenous Case of Filariasis in Sicily.]—*Malaria e Malat. d. Paesi Caldi.* 1916. May–June. Vol. 7. No. 3. pp. 141–145. With 1 coloured plate.

Notes of a case of filariasis in a woman, 52 years of age, who had never been out of Sicily, and had spent the greater part of her married life in Messina. When that town was devastated by an earthquake a few years ago, she was forced to reside at a place some 14 kilometres distant, named San Stefano Soprano, for a period of two years, after which she returned to Messina. She then began to suffer from ill-health, and came under professional care. The urine was found to exhibit the usual characters of filarial infection, and microscopic examination showed the presence of filariae in it. A similar examination of the blood was then made by night, and more filariae were found.

The author thinks that this case is conclusive proof that filariasis is now endemic in Sicily, having probably been introduced of recent years by emigrants returned from abroad.

J. B. N.

MCNAUGHTON (J. G.). **Treatment of Filariasis and Elephantoid Conditions by Intramuscular Injections of Salvarsan.**—*Jl. Trop. Med. & Hyg.* 1916. Nov. 1. Vol. 19. No. 21. pp. 249–250.

There is much elephantiasis in the Ellice Islands near Samoa [see this *Bulletin*, Vol. 6, p. 355]; probably 20 to 30 per cent. are affected. In five cases salvarsan has been administered with good results. Elephantoid lesions in limbs of at least ten years' standing apparently diminish in size after treatment. The author says, "if other cases react to salvarsan as those I have observed I see no reason why elephantiasis should not be completely wiped out."

In 90 cases of yaws treated with salvarsan and neosalvarsan no elephantoid fever occurred after the injection although elephantiasis is very prevalent in this region.

The cases cited are: (1) Elephantiasis ten years, enlarged scrotum and leg. Attacks of "fever" at least once a month. During an attack ·3 gm. salvarsan was injected. No fever since. No filariae now found in blood. Right leg smaller than in 1914.

(2) "Elephantoid fever" recurring at least every two months since 1896. In 1914 both legs had become elephantoid. In 1914 he received ·3 gm. of salvarsan. No fever since. Both legs now normal.

(3) Elephantoid fever since 1883 at least every three weeks. In March 1916 ·3 gm. salvarsan was injected. No fever since, leg slightly smaller.

(4) No visible thickening of scrotum or leg. Has had elephantoid fever for many years. After salvarsan fever and microfilariae disappeared.

(5) Elephantiasis of scrotum, both legs and arms. History dating back twenty years. After removal of scrotum elephantoid fever recurred every ten days. On the day after intramuscular injection of salvarsan this disappeared and has not recurred.

R. T. L.

JOJOT (Ch.). **Aperçu médical sur la campagne du Cameroun de 1914-16.**—*Bull. Soc. Path. Exot.* 1916. Oct. Vol. 9. No. 8. pp. 584–591.

It is noted that guineaworm, hitherto unknown in Cameroon, has been introduced in the course of the campaign and that abscesses due to this worm were common. [It does not appear however from the details given that any of the cases were actually contracted in Cameroon.]

R. T. L.

IRVINE (W. L.). **Topographical Extracts from Annual Sanitary Reports. Monrovia, Liberia; Freetown, Sierra Leone.**—*U.S. Nav. Med. Bull.* 1916. Oct. Vol. 10. No. 4. pp. 725–736. With 1 chart.

At Monrovia all meat is inspected by a sanitary officer prior to consumption. During 1914, 23 bullocks out of 3,742 slaughtered were condemned on account of *Cysticercus bovis.*

Under Freetown the author states that microscopic examination of faeces of 986 patients showed the presence of ancylostome ova in 44·4 per cent. among all classes of patients. The spread of this infection is said to be favoured by the absence of floors in the huts and the habit of going barefooted. During the above investigations four cases of rectal bilharziasis were found. In none was the urinary tract affected. The degree of infection was slight and symptoms were absent. The natives came from four different tribes. These are probably the first recorded cases of *Bilharzia mansoni* in the colony.

Cases of elephantiasis are mostly scrotal and are quite common. Some medical officers estimate the racial incidence of filariasis to be as high as 30 per cent. Microfilariae were found in the night blood in 9·7 per cent. of 964 patients and in 11·8 per cent. of 118 prisoners in Freetown Jail.

R. T. L.

HASSELMANN (Gustavo E.). **Anatomia e physiologia pathologicas. Pesquizas parasitologicas.**—*Arch. Brasileiros de Med.* 1916. May. Vol. 6. No. 5. pp. 274–279.

In 61 out of 80 autopsies made in Rio de Janeiro a macroscopical examination of the intestines was made. Helminths were found in 83 per cent. of cases. These totalled 3,145 specimens and belonged to the species *Necator americanus*, *Ancylostoma duodenale*, *Trichocephalus trichiuris*, *Ascaris lumbricoides*, *Oxyuris vermicularis* and *Taenia saginata*. The incidence of the various species in each of the 51 cases and the age, nationality, profession and lesions of the individual patients are tabulated.

R. T. L.

SANGIORGI (G.). **Osservazioni sulle feci dei soldati ricoverati negli ospedali militari territoriali di Venezia.** [Observations on the Stools of Soldiers received into the Territorial Military Hospitals of Venice.]—*Giorn. di Med. Milit.* 1916. April 30. Vol. 64. No. 4. pp. 278–281.

The author found ova of intestinal worms in the stools of as many as 1,000 soldiers out of 2,620 examined, being a proportion of 38·13 per cent., the diagnoses of ova found being as follows :—

	Cases.	Per cent.
Ascaris lumbricoides, alone	429	22·4
Trichocephalus trichiuris, alone	389	21·3
Ascaris and *Trichocephalus*, together	169	—
Anguillula intestinalis, alone	6	0·26
Taenia saginata, alone	3	0·15
Taenia and *Trichocephalus*	1	—
Ascaris and *Anguillula*	1	—
Ancylostoma duodenale	1	0·07
Ditto and *Trichocephalus*	1	—

Statistics are given of the occupations of the soldiers affected, from which it appears that peasants, as might be expected, formed nearly 50 per cent. of the whole. [As, however, it might be assumed that peasants, in a population like the Italian, would numerically predominate in the national army, this criterion is not of much value, statistically.] The men had all been mixed up in the trenches before coming into hospital, so that the dates and modes of their infection could not be determined.

J. B. N.

LANE (Clayton). **The Correct Names of the Helminths of Man.**—*Indian Med. Gaz.* 1916. May. Vol. 51. No. 5. pp. 165–173.

Alterations in the names of parasites, although a constant source of annoyance to medical men, are governed by the rules of zoological nomenclature as a whole. These rules were adopted by the International Zoological Congress for 1901. Later an International Official List of Generic Names was instituted and it was agreed to fix the spelling and authoritatively pronounce upon the priority of certain names. The author has gone over the names of the various helminths

that occur in man and endeavours to arrive at the " correct " name for each species in the light of these recent rulings. In many instances his findings tally with the nomenclature of the more up to date text-books.

With the literature at his disposal the author says he is unable to explain why RAILLIET and HENRY in 1911 substituted the name *limbata* for [*Ascaris*] *marginata*, a common dog parasite found rarely in man.

The common seat worm *Oxyuris vermicularis* is written as *Oxyuris* (*Oxyurias*) *vermicularis*, indicating that the species belongs to the subgenus *Oxyurias* in the genus *Oxyuris*. Some recent writers in systematic helminthology cite the worm as *Oxyurias vermicularis*, in the belief that it belongs to a genus distinct from Oxyuris as now typified by *Oxyuris curvula* in the horse.

Filaria demarquayi appears under the name *F. juncea* recently proposed by RAILLIET, while *Filaria ozzardi* is paragraphed separately, its synonymy with *Filaria juncea* being left unsettled. Similarly the position of *Oesophagostomum brumpti*, although listed under *O. apiostomum*, is considered to be undecided. *Triodontophorus deminutus* is left in the original genus ; the author is with those who regard the recent classification of the bursate nematodes as to some extent artificial.

As regards *Syngamus kingi* it is [properly] pointed out that CASTELLANI and CHALMERS are in error in identifying this worm with *S. trachealis*. The common whipworm appears as *Trichuris trichiura*, a name given by ROEDERER and WAGLER in 1761. *Gnathostoma siamense* is accepted as a synonym of *G. spinigerum*. *Eustrongylus gigas* of the text books disappears in favour of *Dioctophyme renale* and the familiar *Echinorhynchus gigas* becomes *Gigantorhynchus hirudinaceus*. *Distoma lanceolatum* is now *Dicrocoelium dendriticum* on ODHNER'S authority. Amongst the tapeworms we find *Taenia pisiformis*, commonly known as *Taenia serrata*. *Taenia teniaeformis* is, somewhat obscurely, paragraphed separately, but is apparently a synonym of this cysticercus. [That it does not occur in man however is not stated.] The coenurus also is included in the list as the species *Multiceps socialis*.

Taenia echinococcus appears as *Echinococcus granulosus* and *Bothriocephalus latus* as *Diphyllobothrium latum*, the author accepting GEDOELST'S view that the broad tapeworm is cogeneric with *D. stemmacephalum* Cobbold. *D. cordatum* is placed in the same genus.

[The printers are apparently responsible for certain unfortunate errors in the list such as Oncocerca, cylanicum, Triodonphorus, Hoemonchus.]

R. T. L.

KOLMER (J. A.), TRIST (M. E.) & HEIST (G. D.). **Complement Fixation in Intestinal Parasitism of Dogs.**—*Jl. Infect. Dis.* 1916. Jan. Vol. 18. No. 1. pp. 88–105.

As a result of complement fixation tests with the sera of infested dogs it is believed that there is a production of antibodies, especially in the case of tapeworm infections. It occurs also to a less degree with ascarides and very slightly with whipworm.

A "biologic relation" is said to be revealed between *Ascaris canis* and *Eustrongylus gigas* and between *Taenia serrata* and *Dipylidium caninum*. This points to the probability that complement fixation tests while indicating the presence of a parasite will not differentiate between related species. Similar investigations are being made on the value of complement fixation tests in the diagnosis of intestinal parasitism of man.

R. T. L.

Helminthological Notes.

*East Africa Protectorate.**—The total number of admissions at the native hospital, Mombasa, for the year 1914 from all causes was 2,125. Of these 585 are recorded as suffering from dysentery, diarrhoea and helminthic diseases. Eighty-eight are definitely tabulated as helminthic diseases and of these 27 are reported as having died.

The first hundred examinations of natives, of indigenous races, complaining of intestinal troubles admitted into or attending Hospital showed evidence of helminthiasis in 83 per cent.

In the positive cases the different ova of parasitic worms were found in the following percentage :—

Ankylostomes	46	per cent.
Ascaris lumbricoides	44	,,
Trichocephalus dispar	43	,,
Taenia saginata	29	,,
Schistosomum mansoni	5	,,
Oxyuris vermicularis	2	,,
Strongyloides stercoralis	3	,,

The single case of guineaworm occurred at Meru in an Indian recently arrived from India.

Of the Colony as a whole it is stated that the number of in-patients treated for helminthic diseases during the year in the Government Hospitals was 92 with 36 deaths. Diseases of this class have been observed in all parts of the country. The wide distribution of ankylostomiasis on the Coast Belt has been represented to the military authorities. No case of haematuria is returned.

Uganda Protectorate.†—There were 151 cases recorded under Cestoda, of which 110 are returned as *Taenia saginata* and 41 as *Taenia solium*. Of 1,751 Nematoda, 1,211 cases are classified as Ascaris, 135 as Dracunculus and 380 as Oxyuris.

No case of haematuria is returned.

Zanzibar Protectorate.‡—In the last year's report special attention was drawn to the serious amount of chronic illness and disablement throughout the island from the widespread distribution of hookworm disease.

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* *East Africa Protectorate Ann. Med. Rep. for the Year ending* 31*st Dec.*, 1914, pp. 20–21.

† *Uganda Protectorate Ann. Med. & Sanit. Rep. for the Year ended* 31*st Dec.*, 1914. p. 14.

‡ *Zanzibar Protectorate Rep. on Med. Dept. for the Year* 1914. p. 7.

During 1914 out of 185 admissions of in-patients from the African Police 22 were cases of ankylostomiasis.

Two in-patients and 173 out-patients were treated for haematuria; none of these are returned as Bilharzial. It is stated that "many cases are gonorrhoeal from prostatic and urethral congestion and some reported are probably due to Bilharzia, but the figure for out-patients suggests some looseness in diagnosis or an unjustified faith in mere verbal assurances." When cases of bilharzia do occur they practically all originate from villages on the banks of the Mwera River.

Filarial Lymphangitis occurred in 67 cases.

Elephantiasis: 20 in-patients with one death and 118 out-patients.

Elephantiasis of the legs and scrotum is extremely common; of arms, breast, abdominal tissues, scalp, etc., less common.

Cestodes occurred in 35 cases, mainly among mainland natives from their habit of eating meat superficially charred.

Ankylostomiasis. There were 152 in-patients with 11 deaths and 102 out-patients; "the increase of this debilitating infection throughout the Protectorate within the last few years is very serious."

*Nyasaland.**—A beginning was made in the North Nyasa district for dealing with ankylostomiasis by the institution of village latrines and the appointment of native sanitary inspectors to supervise the work. It was estimated that quite 95 per cent. of the natives within a radius of 10 to 15 miles of Karonga had adopted deep pit latrines; on the outbreak of war these measures had to be suspended.

Ten cases of infection with *Dracunculus medinensis* are mentioned in the returns of the Zomba Native Hospital. Of these three occurred in females.

Gold Coast.†—The following notes are given under Helminthic Diseases:—

Ankylostomiasis.	1913.	1914.	1915.
Cases ..	22	60	30
Deaths ..	3	4	*Nil.*

The constant crusade against promiscuous defaecation is the chief preventive measure adopted.

Taenia.	1913.	1914.	1915.
Cases ..	737	716	669

Inspection of meat by the Medical Officer or his deputy is the chief precaution taken against the consumption of "measly" carcases.

Bilharzia.	1913.	1914.	1915.
Cases ..	17	48	26

Guineaworm.	1913.	1914.	1915.
Cases ..	1,524	1,598	799

	1914.	1915.	Decrease.
Accra ..	375	123	67%
Ashanti ..	385	189	47%
Winnebah ..	249	44	82%

* *Nyasaland Protectorate Ann. Med. Rep. on the Health & Sanit. Condition for the Year ended 31st Dec.*, 1914. p. 20.

† *Gold Coast Med. & Sanit. Rep. for the Year* 1915.

The decrease at Accra in 1915 is very striking and is considered as due to the new pipeborne water supply. In Ashanti the decrease corresponds with a reduction in the number of troops stationed at Coomassie and Sunyani, while that at Winnebah is relative only to the decline in the total number of out-patients for the year.

R. T. L.

Hookworm Campaigns (1914).

In 1909 Mr. John D. Rockefeller gave a million dollars to a Commission of thirteen of the leading educators, physicians and business men of the United States, to be used during the ensuing five years towards the eradication of Ankylostomiasis in that country.

In this work the co-operation of the physicians, the educational forces and the press was successfully enlisted During the five year period 1,273,850 persons were examined and 694,516 were reported to be infected and were treated. About a quarter of a million were treated by the local practitioners working in co-operation with the Commission; the rest were dealt with in temporary dispensaries under the control of specially appointed directors. These country dispensaries had a campaign period ranging from four to eight weeks in each site, a time insufficient to develop satisfactorily the sanitary aspect of the question along with the curative measures.

With growing experience it was found advisable to lengthen the working periods, to limit the area to be worked, and intensify the efforts to put into effect side by side the curative and preventive measures.

In the latter months of the Commission's activities the work proceeded more and more on preventive and " intensive " treatment lines. Their activities not only roused the public authorities and the people in the various states to an appreciation of the fact that ankylostomiasis was widely prevalent as a serious and demoralising infection, but by focussing attention on the part played by soil pollution in the spread of disease generally thereby contributed greatly to the promotion of Public Health interests generally wherever their campaign was conducted.

These results encouraged Mr. Rockefeller to consider an extension of the work and scope of the Commission. In 1913 the Rockefeller Foundation undertook the promotion of public sanitation and the spread of the knowledge of scientific medicine and extended its assistance " for the relief and control of hookworm disease to those countries and peoples where conditions invite."

The first extension of the work outside the United States was inaugurated in 1914 in some of the British Dependencies, where the stability of the government and the official use of the English language made them a most suitable field for beginning work which it was intended later to extend to other countries. Ankylostomiasis is widespread throughout tropical and subtropical regions and it is to be expected that as matters revert to normal conditions the value and importance of the co-operation of the Rockefeller Foundation will be increasingly recognised and utilised. It is intended therefore to devote periodically a section of this *Bulletin* to an account of the various hookworm campaigns in progress from time to time in tropical regions, and to supplement the summaries of the official reports issued by the

International Health Commission with abstracts of the more interesting local details and observations made by the medical officers in charge to the local authorities in their periodical reports.

General Methods.—In each country where work is undertaken it is done under the authority and direction of the Government there. This is regarded as fundamental. The International Health Commission does not undertake the eradication of ankylostomiasis in any country; the infection can only be brought finally under control by means of permanent agencies working over long periods. The Commission therefore, while co-operating with Governments in the work of immediate relief, seeks to do this in such a way as to aid in building up permanent public health agencies for the control of this disease and all other diseases.

Work is begun in each country on a small scale. Opportunity is thus gained without waste of funds to experiment with agencies and methods until they have been properly adapted to local conditions. When the effective working unit for a given locality is arrived at it can be multiplied at will.

Two principal methods have been followed by the Commission. One is known as the Dispensary method, the other as the Intensive method. Their activities tend to develop more and more in the latter direction. The dispensary method is defined as follows: It has three main features, (1) examination and treatments; (2) infection survey; (3) sanitary survey. The "intensive" method requires: (1) operation within a definite area; (2) enumeration of the entire population in this area; (3) examination of the entire population in the area; (4) treatment of all found infected; (5) careful re-examination of every patient under treatment after each weekly course of medicine until a cure is effected; (6) the Government should co-operate with its sanitary organisation to prevent reinfection by providing against contamination of the soil. During 1914 field work was in progress in British Guiana, Antigua, Trinidad, St. Lucia, St. Vincent, Grenada, Panama, Costa Rica, and Egypt.

The total number of persons examined and treated is tabulated in the first annual report of the International Health Commission as under:—

(*1*). *Examinations and Treatments.*

General Summary (1914).

	Total	British Guiana	Trinidad	St. Lucia	Grenada	Panama	Costa Rica	Egypt
Examined	37902	9481	4528	750	1505	5321	4412	11905
Infected	21483	5562	1635	512	814	2907	3341	6712
Percentage Infected ..	56·6	58·6	36·1	68·2	54·1	54·6	75·7	56·3
Treated	19425	4676	1635	512	1158	2562	3341	5541
Percentage Treated ..	90·4	84·0	100·0	100·0	....	88·1	100·0	82·5
Cured	4981	3701	270	....	....	....	179	831
Percentage Cured ..	25·6	79·1	16·5	....	....	....	5·3	14·9

Further details of the individual campaigns during 1914 and remarks made in their official reports to the local governments by the officers in medical charge are given under each colony.

British Guiana (1914).*

The first Hookworm Campaign undertaken in a foreign country by the International Health Commission was commenced in British Guiana in the spring of 1914, in the Peter's Hall District on the east bank of the Demerara River, lying just south of Georgetown. The area, which was divided into three parts A, B, and C, is about eight miles long and from one to three miles wide.

In Area A the beginning of treatment was delayed until November owing to radical sanitary work in progress, a relocation of streets and other improvements.

In Area B the campaign commenced in March and extended till December. In the area daily doses of ten grains of thymol were used in the treatment of those infected. At the end of the year there still remained more than 200 cases not yet cured by the daily dose. They were then put on the large weekly dose in use in Areas A and C.

Operations in Area C commenced in September 1914. During the year 9,481 persons were examined out of 10,378 on the census of the district. Of these 5,562 were found to be infected. Up to 31st December 1914, 3,701 or 75·5 per cent. had been cured, while 975 or 19·8 per cent. remained under treatment. [As the work was completed in the following year the detailed statistics of the Peter's Hall District are incorporated with those of 1915 and are tabulated in the summary which will appear under that year.]

Antigua (1914).†

A systematic investigation into the prevalence of ankylostomiasis in Antigua was conducted by Dr. Eric MARSHALL between 1st August and 27th November 1914. His work is summarised in the following table.

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* *Rockefeller Foundation. International Health Commission First Ann. Rep.* June 27, 1913–December 31, 1914. [Dr. Wickliffe ROSE, Director-General.] 1915. New York: Offices of the Commission. pp. 41–53.

† *Loc. cit.* pp. 53–56.

Microscopical Examinations.

Estate Districts.	Examined.	Infected.	Percentage of Infection.
Lime Stone Area	547	36	6·5%
Central Plain	689	84	12·1%
Volcanic Area	486	156	32%
Falmouth	20	0	—
English Harbour	46	0	—
Urlins	13	0	—
Johnson Point	17	0	—
Five Islands and Galley Bay ..	21	0	—
Total for Estates	1,839	276	15%
Institutions.			
Prison	70	18	25·7%
Poor House (Males)	39	1	2·5%
,, ,, (Females)	57	5	8·7%
Industrial School	35	13	37·1%
Hospital	247	60	24·2%
Lunatic Asylum..	48	22	45·8%
Local Cases	158	11	6·9%
Bishop Matthews' School ..	221	6	2·71%
Total for Institutions ..	875	136	15·5%
Grand Total	2,714	412	15·1%

From the above survey Dr. Marshall draws the following conclusions :

" (1) In certain districts a large percentage of the population are suffering from ankylostomiasis.

" (2) It is the cause of much sickness at the present time.

" (3) Under certain conditions it might become a menace to the health of the whole island.

" (4) At the present time, owing to its distribution, it can be readily dealt with by an intensive campaign.

" (5) It is in some districts of considerable economic importance to the planters.

" (6) It is of vital importance to a large percentage of the labouring population."

Dr. Marshall recommended that laws be passed for the compulsory examination and treatment of all inhabitants, and the construction and maintenance of suitable latrines.

In his "Report on Ankylostomiasis in Antigua," issued as a Government paper in Antigua, Dr. Marshall states that the absence of sanitary arrangements and conveniences is common throughout all the

country districts, so that outside the town area "the actual distribution of the disease is entirely dependent on the climatic and soil conditions influenced by drainage."

In the Lime Stone Area, which consists of the North-West corner of St. John's and the Northern part of St. George's, St. Peter's and St. Philip's Parishes the disease is never likely to be of any economic importance and can never seriously affect the labour output.

In the Central Plain the disease at the present time is not of a serious nature, but owing to the clay soil a series of wet seasons might more seriously affect the health of the population.

If at any time it was decided to establish a system of damming to irrigate the lands in the Lime Stone Area and Central Plain, the disease might become a menace.

In the Volcanic Area, lying to the south of Oyster Bay and the foothills north of Liberta and Grace Hill village, the average rainfall is heavier than elsewhere in the island and the soil in the lower land is mostly heavy clay. This district is the chief centre for "nigger holdings" and at the present time the prevalence and incidence of the disease is a serious menace to the population and economically of some importance.

Dr. Marshall is of opinion that compulsory examination and treatment is the only effective way of dealing with ankylostome infection in Antigua.

Trinidad (1914).*

Col. J. R. Dodd commenced work on August 11th, 1914. A central laboratory and headquarters were opened at San Fernando and branch laboratories at Couva, Princes Town and La Brea.

The work accomplished up to December 31st, 1914, by the combined laboratories is as follows :—

Number of persons examined	4,528
Number of persons treated	1,635
Number of persons reported cured	270
(after microscopical confirmation).	

A partial sanitary survey was made in the localities where work was being carried on : 664 out of 1,636 premises inspected had no latrines, in 96 trenches were used, in 679 cesspits, in 129 pails, and 68 had sheds only.

* *Loc. cit.* pp. 56–58.

Col. DODD in his report (*a*) for August 1914 states that an examination of all newly arrived immigrants from India allotted to this district revealed an ankylostome infection of exactly 50 per cent., a fact which points to the necessity for treatment before these immigrants are drafted to the estates, if reinfection of treated areas is to be avoided.

In the report (*c*) for the month of December 1914, it is remarked that the planters in the neighbourhood of San Fernando are endeavouring to meet the requirements of recent legislation by providing latrines for their immigrants living in barracks.

In the reports (*b* & *c*) for October, November and December 1914, the following infections with parasites other than ankylostomes are recorded :—

	No. examined.	Ascaris.	Trichocephalus.	Strongyloides.	Tapeworm.
October ..	278	20	42	14	2
November ..	1,420	218	173	—	1
December ..	575	68	20	—	2
Totals ..	2,173	306	235	14	5

St. Lucia (1914).*

A preliminary investigation into the distribution and prevalence of ankylostomiasis was conducted by Dr. S. BRANCH. The results up to December 31st, 1914 are :—

	Examined.	Infected.	Treated.
Castries (town)	211	97	97
,, (rural)	221	147	147
Babonneau and Gros Islet ..	55	45	45
Cul de Sac Valley	50	41	41
(*a*) Crown Lands	22	19	19
(*b*) Ferrands	12	12	12
(*c*) Soucis	96	82	82
(*d*) Forestier	40	33	33
Roseau Valley and beyond ..	43	36	36
Total	750	512	512

(*a*) Report from Col. R. DODD in charge of Ankylostomiasis Operations, International Health Commission, for the month of August, 1914, Trinidad and Tobago Council Paper 144 of 1914.

(*b*) Report by the Officer in charge for the months of October and November 1914. Trinidad and Tobago Council Paper 195 of 1914.

(*c*) Report of the Officer in charge for the month of December 1914, Trinidad and Tobago Council Paper No. 2 of 1915.

* *International Health Commission Ann. Rep.* for 1914. pp. 58–9.

Grenada (1914).*

The campaign was initiated under the Directorship of Dr. Angus MacDonald on the 28th August. After preliminary arrangements had been made actual work commenced on 1st December. The report to December 31st gives the following results :—

	Examined.	Infected.	Treatments. [Not No. treated.]
Institutions—			
Mount Mortiz	223	153	116
Gouyave	192	94	161
Birchgrove	226	115	150
St. Dominic's	240	140	189
Head Office, Marine Villa ..	624	312	143
			399
Total	1,505	814	1,158

Dr. MacDonald draws the following conclusions :—

1. There is a high rate of hookworm infection in Grenada.

2. All classes (practically), both sexes, all ages, are infected.

3. Present methods of examination indicate an infection of ankylostomiasis to the amount of 74 per cent. of the white peasant settlers in one district, and 64 per cent. of the black population in another. With improved methods of examination, there is no doubt the infection will be shown to be even higher than this.

4. A definite amount of debility, chiefly anaemia, cardiac dilatation and chronic dyspepsia prevails, especially in the more highly infected districts.

5. Dwarfism and infantilism are found amongst those infected, both white and black; but other causes of these conditions are probably operative.

6. The mode of infection is from the soil (mainly).

7. Drinking of polluted water is general, and the resulting dysenteric diseases complicate and are complicated by ankylostomiasis.

8. Malaria complicates diagnosis and treatment of ankylostomiasis and makes difficult any correct allocation of morbid conditions to the causative disease.

Panama (1914).†

Actual work commenced about July 15th under the directorship of Dr. L. W. Hackett. Preliminary operations were begun in the City of Panama and subsequently were extended to Chorrera, Arraijan,

* *Loc. cit.* pp. 60–62.
† *Loc. cit.* pp. 63–67.

Capira, and Bocas del Toro, villages in the interior of the Panama Province. The dispensary plan of work was followed. The following is a tabulated summary of results attained to December 31st, 1914 :—

(1) *Examinations and Treatments.*

District.	Examined.	Infected.	Treated.
Panama City	928	218	215
Chorrera	812	639	562
Arraijan	582	511	494
Capira	987	830	677
Bocas del Toro	2,012	709	614
Grand Total	5,321	2,907	2,562

Infection in Panama City is lighter than in the interior.

(2) *Infection Survey* (Children 6 to 18 years).

District.	Examined.	Infected.	Percentage of Infection.
Panama City	804	196	24·4%
Interior—			
Chorrera	390	321	82·4%
Arraijan	210	196	93·3%
Capira	340	316	93·0%
Bocas del Toro	695	297	42·8%
Total for Interior ..	1,635	1,130	69·1%
Grand Total	2,439	1,326	54·4%

The Sanitary Survey showed that in Panama City every house within the city limits was connected with a sewer. At Chorrera there were seven privy pits, at Capira one, while there was none at Arraijan. At Bocas del Toro night soil was removed and disposed of in the ocean imperfectly and by a few only.

*Costa Rica (1914).**

Dr. H. R. Carter, junr., Temporary Director, commenced active operations on 23rd September, 1914. The people were invited to come for free examination and treatment to stations opened at Puntarenas, Esparta, Chomes and Miramar.

* *Loc. cit.* pp. 67–68.

Reports up to December 31st, 1914, give the following summary of results :—

(1) *Examination and Treatments.*

	Examined.	Infected.	Treated.	Cured.
Puntarenas	2,317	1,510	[Not listed.]	
Esparta	1,260	1,097		
Chomes..	191	179		
Miramar	644	555		
	4,412	3,341	3,341	

The number reported cured is reduced, as re-examination for a positive determination was often not feasible.

(2) *Infection Survey* (Children 6 to 18 years).

	Examined.	Infected.	Percentage of Infection.
Total for country ..	966	883	91·4

The Sanitary Code of Costa Rica requires that the people provide and use latrines. On August 31st, 1914, a decree was issued rendering funds available for use in making this law effective. The work of sanitation is being carried out in the areas in which the people are being examined and treated.

Egypt (1914).*

The local Consultative Committee formulated a plan of operations, for one year, which took as the unit of organisation and work the Province Sharqia, one of the 14 into which Egypt is divided. Conditions in Egypt, it is stated, appear to make it necessary to administer treatment to all patients under hospital conditions.

A certain amount of work had been done in hospitals at Qaliub and Qalama in the Qalubia Province. These hospitals were transferred on August 10th to Sharqia Province and were opened in the towns of Belbeis and Minia-el-Qamh. Cases were also treated in the Murad Pasha Hospital at El Deir. The results for the five hospitals are shown on the following page.

**Loc cit.* pp. 69–76.

(1) *Examinations, treatments and cures.*

Province.	District.	No. of persons examined.	No. of persons infected.	No. admitted to hospitals.	No. of persons treated.	No. of persons re-examined.	No. of persons reported cured.
Qaliubia ..	Qaliub Qalama ..	5,222	1,973	2,126	1,686	139	138
	El Deir ..	688	561	518	459	—	—
Sharqia ..	Belbeis ..	2,175	1,503	1,432	1,383	267	226
	Minia-el-Qamh ..	3,820	2,675	2,180	2,013	514	467
Total ..	—	1,1905	6,712	6,256	5,541	920	831

(2) *Infection Survey* (among the free population and prisoners in Zagazig).

Centre.	Free Population.			Prisoners in Zagazig.		
	Examined.	Infected.	Per cent.	Examined.	Infected.	Per cent.
Zagazig ..	1,256	759	60·4	78	46	58·9
Minia-el-Qamh	1,057	606	57·2	73	61	83·5
Belbeis ..	1,096	546	49·8	49	38	77·5
Faqus ..	868	514	59·2	35	25	71·4
Hehia ..	939	622	66·2	54	43	79·6
Kafr Saqr ..	868	364	42·0	52	41	78·8
Total ..	6,082	3,411	56·08	341	254	74·5

The following details are taken from a report by Dr. MacCallan* :—

Thymol is administered on three consecutive days as the fellah cannot spare the time to remain long from home. All cases are treated in travelling hospitals. The cost per head was about 5 dollars or £1 0*s.* 6*d.* during the half year ending April, 1914. The percentage

* Preliminary Note on the Ankylostomiasis Campaign in Egypt, 1914, by G. A. F. MacCallan, M.D. Read at the Annual Meeting of the British Medical Association, Aberdeen, 1914, and communicated to the Colonial Office.

of haemoglobin in the fellah who is not infected with ankylostomiasis varies from 40 to 80 per cent. ; 60 to 70 per cent. is the amount among those who have not got bilharziasis, those who are so affected have 10 per cent. less haemoglobin. The average rise in haemoglobin under treatment was 19 per cent. at Qualiub (from 34 per cent. to 52 per cent.) and 9 per cent. at Qalama (fron 63·2 per cent. to 72·5 per cent.).

Out of 1,291 patients in whom an estimation of the haemoglobin percentage was made, 65 had a percentage of 10 or less than 10 of haemoglobin. In most of the villages and towns of Egypt there are practically no latrines. Up to the present no method of conservancy has appeared to be practicable owing to the habits of the fellah, the density of the population and the low level of the flat delta country.

R. T. L.

Book Reviews.

Fantham (H. B.) [M.A. (Cantab.), D.Sc. (Lond.)], Stephens (J. W. W.) [M.D. (Cantab.), D.P.H.] & Theobald (F. V.) [M.A. (Cantab.), F.E.S., Hon. F.R.H.S.]. **The Animal Parasites of Man.** Partly adapted from Dr. Max Braun's "Die Tierischen Parasiten des Menschen." (4th Edition, 1908) and an Appendix by Dr. Otto Seifert.—xxxii + 900 pp. With 423 figs. 1916. London: John Bale, Sons & Danielsson, Ltd. [Price 45*s*. net.]

The present work is a comprehensive study of the animal parasites that may infect man. The book is practically a new one, for when the question of a new edition of Braun's "Animal Parasites of Man" was considered, it was found that it was impossible to give an adequate representation of many parts of the subject without practically destroying the original and writing a new book. Much new matter had to be incorporated; numerous alterations were essential and omissions also were necessary. Little of the original matter except historical references remains in the first section on Protozoa, which is new and up-to-date and has been written by Dr. H. B. Fantham. The second section on Worms has been so remodelled by Dr. J. W. W. Stephens that it is practically new, while considerable additions have been made to the third section on Arthropoda, which has been the work of Prof. Theobald. The supplement on treatment, which could not reasonably be expected to be lengthy in a work dealing with the parasites of man as such, has been remodelled in the section dealing with the protozoal diseases, but the sections on helminthic diseases and those provoked by arthropods are stated to be practically a translation of the original.

The work involved has been great. The scientific output during the time that the body of the book was in the press also was large, but the contents have been brought up-to-date by the use of appendices, which are well indexed and give cross references.

An introductory chapter deals with parasitism in general. The characteristics of parasites, their evolution and effects on the host are broadly discussed, while an interesting historical account of the controversy regarding spontaneous generation is included. A list of the more important larger works on parasitology concludes the chapter.

The Protozoa section, pp. 25–210, with its Appendix, pp. 733–752, contains a comprehensive account of the Protozoa directly responsible for disease in man, having potentialities for pathogenicity, or suspected of possibly being injurious to man directly or indirectly. The most recent treatments of the maladies are quoted, with full references to the originals, in the supplement, pp. 617–638.

The Protozoa are described according to their systematic position. A general statement as to the nature of the Protozoa, their body structure, food, movements, inclusions and modes of propagation is given, together with an outline classification containing all the essential features of the classes, Sarcodina, Mastigophora, Sporozoa, Ciliata and Suctoria, with the principal sub-classes of each. There are numerous good, carefully selected and typical illustrations.

The various parasitic members of the Sarcodina are described in detail. The life-cycles of *Entamoeba coli* and of *E. histolytica* in all its phases are given, and Darling's work in correlating the various forms receives due credit. An account is also given of *E. gingivalis* (*E. buccalis* of older writers) and of other amoebae such as those found occasionally in urine. There is also a useful summary of the important experimental work on so-called "cultural amoebae" by Williams and Calkins. The life-cycles of Chlamydophrys, Paramoeba and Craigia are also given.

Full descriptions of the parasitic members of the Polymastigine and Protomonadine sections of the Mastigophora follow the Sarcodina. Great care has been taken to give all the available details of the morphology and life-history of the genera Trichomonas, Chilomastix (Tetramitus) and

Giardia (Lamblia), now so important as excitants of the various flagellate diarrhoeas and dysenteries. The work of LYNCH on the identity of the Trichomonads found in the mouth, lungs, vagina, urethra and alimentary tract also is quoted, the section being very up-to-date.

Parasitic members of the Cercomonadidae, Bodonidae and Trypanosomidae are discussed in detail, their morphology, life-cycle and biology being described and prophylactic measures indicated wherever possible. A careful account of the various trypanosomes in their vertebrate and invertebrate hosts is presented. In connection with *Trypanosoma gambiense* and *T. rhodesiense*, there is a summary of the animal reactions, action of immune serum, baboon and human serum, trypanolytic reactions and cross immunity experiments, together with references to the original papers. It may be mentioned that, when controversial subjects are dealt with, it is obvious that care has been taken throughout to present the opinions of both sides and full references to the originals are given in footnotes, while care has also been taken to give credit to all workers concerned. The life-cycle of *T. cruzi* in *Triatoma megista* and in man is detailed and the possible confusion of one of its supposed stages with Pneumocystis is indicated. The cycles of other trypanosomes are given and the work on the development of arsenic-fast strains of trypanosomes, blepharoplastless trypanosomes and of variations in virulence is both of interest and of practical importance.

The sections dealing with the herpetomonads and Leishmania are well and concisely written, and the summary of the experimental work on the transmission of these parasites should be useful. The experimental evidence of the relationship of the herpetomonad and leishmania, and the recent work on induced herpetomoniasis in vertebrates are included, so that the presentation of the subject is very complete. A full account of the morphology, life-history, modes of transmission and cultivation of the Spirochaetae and Treponemata occurring in man forms an adequate and useful presentation of our knowledge on these important subjects.

The Sporozoa are all parasitic. They are discussed under two groups, the Telosporidia and the Neosporidia, though it is pointed out that the class is possibly not a natural entity, but should be perhaps replaced by two classes of equal rank, corresponding in most respects with the two subclasses named.

The Gregarines, as illustrative of developmental cycles, are briefly described and a more detailed account of the Coccidiidea is given. The life-cycles of Eimeria and Isospora lately have acquired more significance from the rediscovery of these parasites in man, and the accounts given here of their morphology, with a comparison of the periods necessary for the development of the different stages in animal coccidia are therefore very useful. The Haemosporidia, again, are well described, details of the latest results on the development of Haemogregarines, the cultures of human malarial parasites, the differences between the Plasmodia infecting man being all indicated in addition to their morphology and life-histories. The work on Paraplasma, as the presumed agent of yellow fever, is cited, while a slip inserted records the opinion of the Government Commission that these structures are not the excitants of the disease.

The Neosporidia include two genera known to infect man, namely, Rhinosporidium and Sarcocystis. A well illustrated account of these organisms is presented, and other members of the group, which may affect man indirectly, are also briefly described. The Ciliata producing dysentery are also described and illustrated, prophylactic measures being indicated. A concise account of the problematic organisms termed Chlamydozoa, embodying a good summary of the various views held as to the nature of these bodies, their characteristics, structure and life-histories, with their association with disease concludes the section.

It may be mentioned that the appendix on Protozoology contains, in addition to notes on recent researches, the formulae of some protozoal culture media and brief notes on general protozoological technique and staining, including formulae of some of the most useful stains and fixatives.

The section on the Worms by Dr. Stephens is subdivided into three parts, dealing with the Trematodes, Cestodes and Nematodes respectively. A general account of the anatomy and life-history of each class precedes

the accounts of the different genera and species. These general accounts are useful, though marred in several instances by ambiguity of expression or construction. There is a scheme of classification given, and throughout there seems to be a constant groping after classification that at times is almost painful, especially when it is remembered that classification is only a mark of our knowledge for the time being. As the life-cycles of many of that assemblage of organisms known as the Vermes are known only in part, and the range of morphological variation among them has received but the scantiest attention, any classification must necessarily be subjected to much revision when a more detailed knowledge of the organisms has been acquired.

The Trematodes parasitic in man are described in some detail. Many of the species have been found in man only on one or two occasions and are rather accidental than habitual parasites of people. Sixteen genera of flukes are described. They include Watsonius, Gastrodiscus, Fasciola, Fasciolopsis, Paragonimus, Opisthorchis, Paropisthorchis, Amphimerus, Clonorchis, Metorchis, Heterophyes, Metagonimus, Dicrocoelium, Echinostoma, Artyfechinostomum, and Schistosoma. In the description of the interesting genus Paragonimus, there is included the new classification of Ward and Hirsch, based on the character of the spines. The fine work of the Japanese investigators who worked on Clonorchis is detailed, but two species, *C. endemicus* and *C. sinensis*, are retained as separate genera, though the distinctions between them, as has been pointed out, are artificial and hardly justify specific standing. The morphology of the various forms of Fasciolopsis are well set forth. The genus Schistosoma is described in detail, with a long account of the distribution of the worm in the human body, and the pathological changes resulting therefrom. Two species, *S. haematobium* and *S. mansoni* are differentiated, as occurring in Egypt, as the result of the work of the Bilharzia Mission there in 1915, and an inserted slip gives the morphological characters of the two adult worms, derived from experimentally infected mice. The life-history of *S. japonicum*, the first Schistosome cycle to be established, the work having been done by Japanese investigators, is also set forth.

The Cestoda are treated on the same plan as the Trematoda. The introductory portion consists of anatomical details, with an account of the general lines of development. There are a number of illustrations, but some of the diagrams of cysticercoids and cysticercus development are unnecessarily crude. Six main genera are described. The account of Dibothriocephalus is interesting at the present time, owing to the possibility of such infections occurring among prisoners of war and others under war conditions. The genera Hymenolepis and Taenia are treated rather fully. There are a number of statistics regarding the frequency of cysticerci in pigs in Germany and Austria which also have a topical interest. The same remark applies to the statistics relating to the prevalence of Echinococcus. The development of the latter organism is given in great detail.

The Nematoda form a huge group of animal parasites, but fortunately many of them are only occasionally found in man. Nevertheless, those that are frequently found in man have very bad effects upon him. The genera Dracunculus, Filaria, Trichuris, Trichinella, Trichostrongylus, Ancylostoma, Necator, and Ascaris are, perhaps, the more important. Among the Nematodes, there are some members that need an intermediate host for their full development just as in the Cestodes, but others can develop in one host or pass some of their stages in the soil. Thus, they may be readily confused with other worms, whose whole life is passed in decaying matter in the soil. The life history of Strongyloides is given fully and there are some good figures of the various generations. Dracunculus, Ancylostoma and Necator are also described in detail, and some useful figures of forms that might be confused with the larval forms of the last two organisms are given. There is a long account of Trichinella and trichinosis which should be of interest to the sanitarian.

The supplement on treatment of helminthic disease is stated on an inserted slip to be practically a translation of the original, and hence does not contain the most recent information on the subject.

Short sections are given to the Acanthocephala, Gordiidae and Hirudinea. The genera Hirudo and Limnatis are of most importance to man, the latter leech being distributed in North Africa, along the Mediterranean coast, in Syria, Armenia and Turkestan.

The section on the Arthropoda by Prof. Theobald deals with the two chief parasitic groups of the Arthropoda, the Arachnoidea and the Insecta or Hexapoda.

Among the Arachnoidea, the orders Acarina and Linguatulida are considered. The former group of organisms includes many parasitic members that are responsible for various forms of skin complaints, while the ticks responsible for the transmission of spirochaetosis to man and piroplasmosis to cattle are included therein. The life-histories of members of the genus Trombidium and Pediculoides, associated with autumn erythrema [more commonly known as "harvest itch" among harvesters and soldiers] are given, together with an account of the natural habitats of these mites, some of which are found on plants, while others are ecto-parasites on insects. The genus Nephrophages, with other genera suspected of endoparasitic existence in man, is also noted.

The ticks are divided into the two groups, Ixodinae and Argantinae, a somewhat old classification being employed. A useful synopsis of the different genera is inserted containing the chief characteristics of each genus. The genera Ixodes, Amblyomma, Hyalomma, Haemaphysalis, Dermacentor and Rhipicephalus are described and notes as to their normal hosts are appended. When the genera Argas and Ornithodorus are dealt with, the tables of species due to NEUMANN are included. These genera have recently undergone much revision, and perhaps in another edition a newer classification, such as that due to NUTTALL and WARBURTON, might be substituted with advantage. Similarly the use of the term "spirilla" for the spirochaetes of African and relapsing fevers should be abandoned. The descriptions of the different species are accompanied by an account of the geographical distribution of each, but prophylactic measures are seldom indicated. The various "itch insects," species of Glycocophagus and Sarcoptes, are described and a list of the Sarcoptes species that may be transmitted from domestic animals to man is given, together with the dimensions of the parasites.

Linguatula and Porocephalus are treated somewhat fully, but illustrations of the latter organism are lacking.

The section on the Insecta contains a good general account of the group, alternative classifications being set forth. The forms parasitic in or on man occur among the Rhynchota, Coleoptera and Diptera. The parasitic groups are dealt with in the order given. Among the Rhynchota, lice and bugs are the most important insects from the point of view of dissemination of disease. The account of the body lice infesting man is somewhat short and would probably be revised in a future edition, when the fact that the body louse transmits *Spirochaeta recurrentis* and its varieties, responsible for European and North African relapsing fevers, as well as the virus of typhus, would naturally be included. Species of Cimex are also probably responsible for the spread of relapsing fever in Russia. Members of the Reduviidae are frequently a cause of annoyance by means of their bites, but some of them have a more active part in the transmission of disease as has been shown by the work of South American writers. A synopsis based on ROTHSCHILD'S classification of fleas is of service for identification purposes.

The best part of the section on Insecta is that dealing with the various mosquitoes. There is a good introductory section with useful illustrations and an interesting account of the general biology of the members of the principal genera. The differences between certain of the larval forms are also indicated. The Culicidae are then studied in detail, the characters of the true mosquitoes being described and tabulated. The long table of differential characters should be welcomed by the systematist. A similar synopsis of the Stegomyiae, with a more detailed account of *S. fasciata* is given. There are also accounts of the genera Culicoides, and Phlebotomus, which have considerable powers of annoying man.

The house fly is treated as a carrier of dysentery, typhoid, cholera and poliomyelitis and useful notes for decreasing the fly pest are set forth.

The various flies associated with myiases are described, among them being species of Chrysomyia, Pycnosoma, Sarcophaga, and Cordylobia.

Tropical workers will find a classification of the Glossinae of service. There are also good descriptions of the range of *Glossina palpalis* and its haunts and of *G. morsitans*. Both these species are illustrated.

The possible connection of infantile paralysis with attacks of flies is noted in conclusion. The clinical section is concerned mainly with the various forms of "itch" infections and external myiases.

The book as a whole can be considered to be a very useful work of reference. It covers a large range of subjects which are well illustrated and described. There are a number of new illustrations, some of which were drawn specially for this volume. References to literature are presented in the form of footnotes (which are extremely convenient) for recent work on the Protozoa, a classified list of references to earlier work on the Protozoa, and research as a whole on Worms and Parasitic Arthropoda at the end of the volume. There is a copious index with abundant cross-references. The price, 45*s.* net, is high, and it is rather to be regretted that the publishers were not able to produce the book at a little less costly rate.

A. Porter.

NEUMANN (R. O.) & MAYER (Martin). **Atlas und Lehrbuch wichtiger tierischer Parasiten und ihrer Ueberträger mit besonderer Berücksichtigung der Tropenpathologie. Lehmann's Medizinische Atlanten.** Vol. XI. vi + 580 + 93 pp. With 45 coloured plates containing 1,300 figs. and 237 text figs. 1914. Münich: J. F. Lehmann. [Price Geb. M.40.]

*This book is chiefly noticeable for the plates with which it is provided, for the text is somewhat restricted in amount and presents an outline of parasitological subjects such as would be useful for the beginner. The scheme of work is to give a short sketch of any parasite likely to be encountered, and of any economic importance, especially in the tropics, and with it, a short outline of its transmitter if there is any. The result is a somewhat disconnected treatment, an account of the trypanosomes being followed by one of Glossinae, succeeded by one of Leishmania and that followed by certain Rhynchota. Such an arrangement does not lead to continuity of thought, nor does it seem even to be a convenient arrangement, for a knowledge of insect transmitters necessitates information on allied groups which should be studied at the same time.

There is a general introduction to the Protozoa, comprising elementary information on the subject and providing definition such as that of the nucleus. It is noted that the German idea of an intermediate host is that of an insect harbouring *young* forms of the parasite concerned, this idea not being generally adopted. The parasitic amoebae are described and very briefly outlined. There are certain illustrations that are useful, but too few of them. *Entamoeba tetragena* and *E. minuta* are treated as separate entities, and there does not appear to be any correlation of their forms as stages of *E. histolytica*, which is unfortunate. No note is taken throughout this section of other than German work, and the results of DARLING, CRAIG, JAMES and others, though of great importance are never mentioned. The Schaudinnian work receives great prominence.

Among the Flagellates, there are short accounts of Trichomonas, Chilomastix, Giardia and Prowazekia, and then for some reason, *Balantidium coli* is interspersed before the trypanosomes are considered. Again German literature is quoted and more recent publications by other European and American workers are not mentioned.

There is a short account of many animal trypanosomes and then an outline of the life-history of *Trypanosoma gambiense* and *T. rhodesiense* is given. While the work of TAUTE on the identity of *T. rhodesiense* is mentioned, that of LAVERAN and MESNIL and their colleagues find no

* This book was received in May 1914. Unavoidable circumstances have prevented an earlier review.—[Ed.]

place. A diversion to the tsetse flies and such genera as Tabanus follows, then *Trypanosoma cruzi* is discussed, with some interesting new figures of the rounded and transitional forms of the parasite. There is a section with tables on the trypanosomes of birds, reptiles and fishes, a short account of insect flagellates and then Leishmania is described. A section on Rhynchota is now intruded in which the bedbug and Conorhinus [more correctly termed Triatoma] are represented. The Leucocytozoa and Haemoproteus of birds, as set forth by SCHAUDINN, are mentioned and the life-cycle of Coccidia, Haemogregarines, Leucocytogregarines, Toxoplasma, Sarcosporidia and Rhinosporidium are given briefly. An account of the technique connected with the preparation of blood films for examination leads up to the study of the malarial parasites, a part of the work given in much greater detail than the rest. The pathology of malaria and blackwater fever as a sequel, with the commoner treatments, are set forth. There is a detailed account of the anatomy and biology of the malaria transmitting mosquitoes and of Stegomyia, but there are no prophylactic measures indicated, a point that should have received consideration when the biology was discussed, this book having been prepared for tropical workers.

The section on Babesia and Theileria is succeeded by one on Spirochaetes. This again is more accurate than some of the former sections, in that the work of workers other than the authors' fellow countrymen is mentioned. The ticks shown to be inculpated as transmitters of various diseases are described and then a detailed discussion of the Chlamydozoa is presented.

The Protozoa are succeeded by the Nematoda, discussed from the economic standpoint. The Filariae are treated somewhat fully and instructions for their conservation are given. A diagnostic table of the various filariae and microfilariae is rather more useful than some of those in the book and comprises a large amount of information. Trichinosis is well treated and ankylostomiasis is clearly and adequately set forth. Other genera also are included. The coloured plates of Ankylostoma and Necator are excellent.

The section dealing with the Cestodes is not so detailed as that on the Nematodes. There is a general introduction and the details of the genus Taenia and the Echinococcus stage are presented in detail, Dipylidium and Hymenolepis receiving less attention. There is a longer account of *Dibothriocephalus latus* with some good diagrams.

The Trematoda also are outlined in less detail than the Nematoda, and are given treatment on a similar plan to the Cestodes. A series of outlines of the various flukes is given but its value is not obvious, the scale of the drawings being too small. The account of *Fasciola hepatica* is detailed, but the descriptions of other flukes is less so. While the genera Clonorchis, Fasciolopsis and Heterophyes are thus treated, there is a long account of Schistosoma, based chiefly on the work of LOOSS. As the book was published in 1914, the accounts of recent work could not be included, so that reference to current publications or books of 1916 would be necessary to get full information.

Parasitic fly larvae, producing myiasis muscida and myiasis oestrosa are next considered briefly and a short chapter is given to fleas. The latter chapter would be improved by better text figures. Considering the importance of the subject, it is to be regretted that the accounts of the various lice are so scrappy as to be of little use ; in fact, *Pediculus vestimenti* alone is given but the scantiest recognition and there are no particulars of its biology, though it is stated that it is concerned with the transmission of recurrent fever and perhaps typhus. Even at the time of publication, the facts with regard to typhus and relapsing fever had been set forth and the omission is regrettable.

A large part of the book is occupied with the plates. The beauty of their execution cannot be denied. They are most charmingly coloured and the reproduction is exquisite. But it is necessary to make one criticism. It would have been far better, in certain cases, to have illustrated the various organisms on a larger scale, and to have given more figures of diagnostic forms. With the small scale employed, it is almost impossible to show the detail that is necessary, thus rendering the representation frequently unlike

the object. The pictures of Leishmania furnish an illustration of the bad effects of the smallness of scale. However, it is evident that much care has been expended on the illustrations, and that, in spite of the deficiencies indicated, they form the most useful part of the book.

A. Porter.

DEADERICK (William H.) [M.D.] & THOMPSON (Loyd). [M.D.]. **The Endemic Diseases of the Southern States.** 546 pp. Roy. 8vo. Illustrated. 1916. Philadelphia & London: W. B. Saunders Co. [Price 21*s.* net.]

The diseases treated in this book—on the endemic diseases of the Southern States—are, malaria, blackwater fever, pellagra, amœbic dysentery, hook-worm disease, and "other intestinal parasites." They are what we should call, with the exception of pellagra, tropical diseases. Of recent years it has become common knowledge that the Southern of the United States are severely visited by some of the so-called tropical diseases. Hook-worm infection is so prevalent and causes so much loss of health and efficiency that in 1909 the Rockefeller Sanitary Commission was formed to deal with this specific problem and in 1910 work was started in nine States. In a recent survey of six of the Southern States for malaria of over 13,000 blood examinations 13·28 per cent. showed malarial parasites (von EZDORF). Pellagra, in the present state of uncertainty as to its causation, must be causing much anxiety to the public health authorities. NILES gives 14 states, a compact south-eastern group, as "among the states where pellagra has assumed formidable proportions." He believes that "a present estimate of forty thousand pellagrins in the United States is not far from correct," and the significance of this figure, in itself not very great, is that a few years ago only a few cases were known.

To come to the work under review, the authors say in their preface that the diseases described are not confined to the states of the South, but are more prevalent there than in the North. Whether the Southern, and especially the south-eastern States, owe the prevalence of these diseases, or at least those of them that are parasitic, to their climate or to the large proportion of negroes in the population or to a combination of these causes, is not discussed by the authors. The low standard of hygiene of the negro population must tend to depress the general average, and it is notorious that the black man with his parasites, given proximity and means of transmission, is a danger to the white. The matter is probably complex. The limitation set themselves by the authors recalled to the reviewer a recent paper by CRAIG on the tropical diseases of the United States [see this *Bulletin*, Vol. 6, p. 422]. He mentions, in addition to those dealt with in this book, relapsing fever and dengue, the latter as occurring commonly in the Southern States, and undulant fever. Deaderick and Thompson say they have purposely excluded filariasis.

Malaria (by Dr. Deaderick) occupies 180 pages, every one of which is interesting. It is the south-eastern states in which the disease is most prevalent, the chief malaria carriers being *A. maculipennis* Meigen and *A. crucians* Wied. Dr. Deaderick considers parthenogenesis of macrogametes as well established. He thus explains long periods of incubation and relapses at long intervals. He frequently refers to it, as in such picturesque passages as the following:—"The conquest of the schizonts seems to be a signal for the macrogametes to lay aside the conventionality of slow sexual reproduction and to conscript recruits rapidly by parthenogenesis." Elsewhere he says, Relapses at long intervals can be explained by parthenogenesis alone.—He does not refer to the views of ROSS and JAMES, nor to the work of D. THOMSON on the persistence of schizonts through the apyretic intervals. Indeed here as in some other details the section is not so much up to date as the title page would lead one to expect.

In the chapter on diagnosis the author discusses the important clinical question: In what proportion of cases is the parasite to be found at a single examination? His own experience is that "in localities in which half of the malarial subjects take quinine in some form before consulting a

physician the parasite can be detected at a single examination of the peripheral blood, taken at random with respect to the stage of parasitic growth, in approximately one-third of the cases only." He regards a mononuclear leucocytosis reaching 15 per cent. as strong evidence of malaria, a point worth noting because CASTELLANI and CHALMERS say: A marked mononuclear increase may arouse suspicion, but by itself is quite useless [in diagnosis].—* The urobilin test is not mentioned, nor does the author discuss the diagnosis of latent malaria.

Treatment gets full consideration in 22 pages. The hypodermic method of administration of quinine, by which is meant the intramuscular method, is employed by Dr. Deaderick in pernicious malaria where patients cannot swallow or retain the drug. He refers to the "certainty and promptness of absorption," but here he must expect to meet critics. He stresses the need of dilute solutions and uses a gram of the bimuriate in 10 cc. of water.

If one may judge from the fact that the first five of the excellent illustrations in the chapter on prophylaxis show water barrels, the breeding of Anopheles in such containers must be commoner in the Southern States than it generally is in the tropics. As to prophylactic quinine Dr. Deaderick writes:—The Koch method [one gram of quinine] every sixth and seventh day has been satisfactory in my hands—but whether this method has succeeded apart from other prophylactic measures we are not told.

Blackwater fever (by Dr. Deaderick) occupies 53 pages. Discussing the comparatively recent appearance of this disease the author notes that "the early pyretologists almost completely ignored the condition of the urine in fevers." The disease was first described in the United States in 1859, in Louisiana. Eleven states are mentioned in which it is found. In the account of its geographical distribution the statement is found, "Crosse says that it is increasing in certain parts of West Africa," the reference (at the end of the book) being to a work published in 1899. Is not this a little misleading? Surely the author could have obtained more recent information. A similar reference to New Guinea bears date 1895. The cause of blackwater is discussed at some length. The author considers malaria as "essentially and solely the predisposing cause," and in some cases also as the exciting cause; he is disposed to regard the haemolysis as a phenomenon of anaphylaxis. The mention of calcium chloride in the chapter on treatment as recommended by VINCENT in 1905 is interesting because it has recently been advised by BURKITT [this *Bulletin*, Vol. 7. p. 29].

The authors collaborate in the sections on pellagra (104 pages) and amoebic dysentery (43 pages). Pellagra is now found in thirty-nine of the forty-eight states of the Union. A chart of distribution from LAVINDER is given. An interesting chapter is that on aetiology, where there is a good account of GOLDBERGER'S views. In referring to his feeding experiment upon convicts on the Mississippi State Penitentiary farm the authors suggest that it would have been more convincing had it been conducted in a pellagra-free territory; it is to be hoped that this can be arranged, though one should not forget that the experiment was well controlled. In the chapter on clinical history we find "SANDWITH who so religiously holds to the spoiled corn theory . . . considers, etc.," the reference being to his book published in 1905. The passing of a decade has given this author time to be converted to other views [see e.g., this *Bulletin*, Vol. 7, p. 50]. In the chapter on prophylaxis the authors give the details of GOLDBERGER'S diet and say that, whether his theory is true or not, they consider his tenets sound. As to drugs they recommend arsenic and especially sodium cacodylate intramuscularly, "usually in 3-grain doses daily." They have a good word also for autoserotherapy, in which a man receives hypodermically the fluid from his own, artificially produced, blister. In this Section are many useful illustrations of the skin eruption.

The amoebic dysentery section is more "up to date" than malaria. *Endamoeba histolytica*, as the organism is called after LEIDY, was first detected in the United States in 1890; the disease is said to be endemic

* CASTELLANI and CHALMERS. Manual of Tropical Medicine. 2nd Edition, 1913. London: Baillière, Tindall and Cox. p. 890.

in most of the Southern States. A full account is given of how to stain the entamoeba in faeces and in the tissues. The plate of *E. histolytica* would gain in value if figures of *E. coli* were there for comparison, but the main differentiating features are provided in a table. Special attention is drawn to the latent cases, such as those described by MUSGRAVE in the Philippines, in which symptoms of dysentery are absent. Since cats can be artificially infected, the authors would prohibit the keeping of them in endemic centres. The account of treatment by emetin is sufficient, but our knowledge of this subject grows daily.

Hookworm disease and "other intestinal parasites" (by Dr. Deaderick) occupy 42 and 33 pages respectively. The credit for the discovery that ankylostomiasis is endemic in the Southern States is given to STILES (1902); the States in question are all those south of the Ohio and Potomac rivers and Arkansas, Louisiana and Texas. A table from the 1913 Report of the Rockefeller Sanitary Commission shows that of 700,734 persons examined 248,221, or 35 per cent. were found infected. Surface closets and soil pollution, as is well known, are largely responsible. The chief victims are agriculturists and cotton mill operatives, the last probably owing to the insanitary condition of their homes. In the chapter on prophylaxis a diagram of the Lumsden-Roberts-Stiles, or barrel, privy is given, which is regarded as ideal for rural homes; it embodies the principles of the sepic tank. For the new world hook worm the name *Uncinaria americana* is, in several passages, retained.

The parasites described in the last chapter are, *Taenia saginata*, *T. solium*, *Hymenolepis nana*, *H. diminuta*, *Strongyloides intestinalis*, *Ascaris lumbricoides*, *Oxyuris vermicularis*, *Trichuris trichiura*, and *Balantidium coli*, the last heading being Myiasis intestinalis. Large and clear figures are given in illustration. The author regards intestinal worms as potential factors for evil, and quotes STITT to the effect that when the prisoners of Bilibid prison infested with worms were quarantined the death-rate fell from 75 to 9 per mille. The details of this experiment have been given by HEISER in a recent paper [see this *Bulletin*, Vol. 8, p. 194]. Of 3,000 prisoners 60 per cent. harboured hookworms and 90 per cent. "some form of intestinal parasite." By thorough treatment of the prisoners, in batches of about 300, the death-rate was reduced as aforesaid. It would seem probable that Dr. Deaderick should have quoted it in the hook worm section. It appears that *Taenia solium* is rare in the south, "far rarer than either the beef tape-worm or the dwarf tapeworm." The dwarf tapeworm is the commonest cestode. The author says that the hosts of this worm are man and certain species of rats and mice; the part played by rodents is usually considered doubtful. [See page 512 of this number.]

An appended list of references contains 547 entries.

The book is well produced. Practitioners in the tropics will find it somewhat heavy to hold, but the clear type is compensation. There are few printer's errors; they chiefly occur in proper names. *Salol* on page 394 (four lines from bottom) should probably be *thymol*. The book can be thoroughly recommended as containing an attractively-written, full and accurate account of the diseases with which it deals and as being much more interesting than a textbook. It is especially a book for the clinician.

A. G. B.

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Reprints and Pamphlets received:—

CORNWALL (J. W.). A Contribution to the Study of Kala-Azar (11).—*Indian Jl. Med. Res.*, 1916.

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GILL (C. A.). Malaria in Muscat.—*Indian Jl. Med. Res.*, 1916.

LAVERAN (A.). Surra, nagana ferox, nagana de l'Ouganda et infections dues au *Trypanosoma rhodesiense.*—*Bull. Soc. Path. Exot.*, 1916.

LEIPER (R. T.). Observations on the Mode of Spread and Prevention of Vesical and Intestinal Bilharziosis in Egypt, with Additions to August, 1916.—*Proc. Roy. Soc. Med.*, 1916.

LEIPER (R. T.). La production expérimentale des bilharzioses égyptiennes.—*Bull. Inst. Egyptien*, 1916.

da MATTA (Alfredo). Geographia e topographia medica de Manáos.—92 pp. 1916. Manáos: Typ. da Livraria Reynaud.

da MATTA (A.). Sur les leishmanioses tégumentaires. Classification générale des leishmanioses.—*Bull. Soc. Path. Exot.*, 1916.

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THWAITES (A. H.). Report on Cancer Research.—*Commonwealth of Australia. Quarantine Service Publication.* No. 11. 58 pp 1916. Melbourne: Govt. Printer.

Note.—On direct application (not through agents or booksellers) any of the foregoing reprints or pamphlets will be sent on loan to any part of the world, the Bureau paying outward postage.

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REVISTA CLINICA, 1916. Sept. Vol. 1. No. 2. Républica de Colombia. Departamento de Antioquia. Medellin: Tip. Bedout.

Book received.

TRANSACTIONS OF THE INTERNATIONAL ENGINEERING CONGRESS, 1915. Index Volume. vi + 273 pp. San Francisco, California: Neal Publishing Co.

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[Continued from BULLETIN, Vol. 8, pp. i.–xxxii.]

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AMOEBIASIS (including Entamoebic Dysentery and Liver Abscess).

BRUG (S. L.). Pigment und andere Einschlüsse in Dysenterieamöben.—*Arch. f. Schiffs- u. Trop.-Hyg.*, 1916. Vol. 20. pp. 433–436. With 4 figs.

CADE (A.) & VAUCHER (E.). Amibiase dysentérique autochtone. Trois cas d'abcès du foie.—*Bull. et Mém. Soc. Med. des Hôpit. de Paris*, 1916. July 13. 3 ser. Vol. 32. No. 23–24. pp. 1042–1048.
[Three cases of amoebic abscess of the liver, of no special interest except that they were contracted in France.]

CECIKAS (J.). Verlauf der Amöbendysenterie in Griechenland.—*Wien. Klin. Woch.*, 1916. Aug. 10. Vol. 29. No. 32. pp. 1009–1010.
[No new facts.]

DALE (H. H.). The Treatment of Amoebic Dysentery Carriers. Note on the Use of the Double Iodide of Emetine and Bismuth.—*Jl. Roy. Army Med. Corps*, 1916. Aug. Vol. 27. No. 2. pp. 241–244.

DOBELL (Clifford). Incidence and Treatment of *Entamoeba histolytica* Infection at Walton Hospital.—*Brit. Med. Jl.*, 1916. Nov. 4. pp. 612–616.

EICHHORN (Adolph) & GALLAGHER (Bernard). Spontaneous Amebic Dysentery in Monkeys.—*Jl. Infect. Dis.*, 1916. Sept. Vol. 19. No. 3. pp. 395–407. With 6 text figs.

JEPPS (Margaret W.). Note on Some Examinations and Treatments for *Entamoeba histolytica* Infections.—*Brit. Med. Jl.*, 1916. Nov. 4. pp. 616–617.

KILGORE (A. R.). Peripheral Neuritis following Emetin Treatment of Amebic Dysentery.—*Boston Med. & Surg. Jl.*, 1916. Sept. 14. Vol. 175. No. 11. pp. 380–382.

LARIMORE (Joseph W.). Endemic Endamebic Dysentery.—*Interstate Med. Jl.*, 1916. Sept. Vol. 23. No. 9. pp. 742-751.

LOW (George C.) & DOBELL (Clifford). Three Cases of *Entamoeba histolytica* Infection treated with Emetine Bismuth Iodide.—*Lancet*, 1916. Aug. 19. pp. 319–321.

MARTINEZ (F. F.). Les premiers cas de dysenterie tropicale en Espagne.—*Presse Méd.*, 1916. June 29. No. 36. pp. 284–285.

[This paper merely calls attention to the fact, apparently for the first time, that amoebic dysentery occurs in Southern Spain.]

MITCHELL (O. W. H.), CULPEPPER (W. L.) & AYER (W. D.). *Endameba buccalis* in the Mouths of Institutional Children.—*Jl. Med. Res.*, 1916. Sept. Vol. 35. No. 1. Whole No. 158. pp. 51–53.

RISQUEZ (Jesús Rafael). Una complicación poco frecuente del absceso hepático.—*Gaceta Med. de Caracas*, 1916. Aug. 31. Vol. 23. No. 16. pp. 121–122.

WEMYSS (H. L. Watson). A Case of Amoebic Abscess of the Liver.—*Edinburgh Med. Jl.*, 1916. Oct. New Ser. Vol. 17. No. 4. pp. 255–258.

See also **Dysentery (unclassed).**

BERIBERI AND POLYNEURITIS AVIUM.

BAUJEAN (R.). Epidémie de polynévrite palustre simulant le béribéri.—*Bull. Soc. Path. Exot.*, 1916. Oct. Vol. 9. No. 8. pp. 634–647.

EIJKMAN (C.). Invloed van de voeding en van voedselonthouding op het onstaan van polyneuritis gallinarum. Naar gemeenschappeljk met Dr. C. J. C. van Hoogenhuyze ingestelde onderzoekingen medegedeeld.—*Geneesk. Tijdschr. v. Nederl.-Indië*, 1916. Vol 56. No. 3. pp. 257–294.

FINDLAY (G. Marshall). Note on a Case of Beri-Beri.—*Lancet*, 1916. Oct. 7. pp. 646–647.

HOLMES (B.) & RETINGER (J.). An Apparent Recovery of a Chicago Chinaman from Beriberi after Three Doses of Vitamine containing Extract of Rice Polishings.—*Illinois Med. Jl.*, 1916. Vol. 29. pp. 178–180. [*Index Medicus.*]

LHERMITTE (J.). Les lésions cérébrales de la polynévrite avitamique (Béri-Béri experimental).—*Rev. Neurologique*, 1916. July. Vol. 23. No. 7. pp. 6–8.

MEIRELLES (E.). Atravez do beriberi na casa de detenção.—*Tribuna Med.*, 1915. Vol. 21. pp. 147; 161. [*Index Medicus.*]

SILVADO (J.). Critica da theoria verminosa do beriberi.—*Tribuna Med.*, 1915. Vol. 21. pp. 219, 239, 251. [*Index Medicus.*]

VEDDER (Edward B.). The Known and the Unknown with Regard to the Etiology and Prevention of Beriberi.—*Milit. Surgeon*, 1916. Oct. Vol. 39. No. 4. pp. 368–379.

WILLCOX (William Henry). Beriberi—With Special Reference to Prophylaxis and Treatment.—*Jl. Roy. Army Med. Corps*, 1916. Aug. Vol. 27. No. 2. pp. 191–202.

[Paper is same in facts as that published in the *Lancet* and reviewed in this *Bulletin*, Vol. 7. p. 372.]

BLACKWATER FEVER.

MARCANDIER (André). La résistance globulaire dans quelques cas de paludisme, de fièvre bilieuse hémoglobinurique et de maladie du sommeil.—*Bull. Soc. Path. Exot.*, 1916. Oct. Vol. 9. No. 8. pp. 647–665.

MAURY (Carlotta J.). A Reputed Specific for Blackwater Fever.—*Science*, 1916. N.S. 43. p. 349. [*Index Medicus.*]

OTT (William O.). Hemoglobinuric Fever treated by Infusions containing Quinin.—*Jl. Amer. Med. Assoc.*, 1916. Sept. 16. Vol. 67. No. 12. pp. 872–874. With 1 chart.

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AZZI (Azzo). Reazioni del vibrione de colera e di altri germi con sostanze coloranti decolorate.—*Riforma Med.*, 1916. Aug. 21. Vol. 32. No. 34. pp. 921–924.

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[An account of ROGERS' work on cholera therapy from 1895–1915. Nothing new.]

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GALAMBOS (A.). Erfahrungen über die Cholera asiatica.—*Therap. d. Gegenw*, 1915. Vol. 56. pp. 452–456.

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MASSI (U.). Il liquido ascitico nella diagnosi del vibrione de Koch.—*Bull. Soc. Med. di Bologna*, 1916. New Ser. Vol. 4. pp. 69–73 [*Index Medicus.*]

MENDELSON (Ralph W.). Experiences with the Use of Combined Vaccines in the Present War, with Special Reference to the Tetravaccine Typhoid + Paratyphoid A + Paratyphoid B + Cholera.—*Milit. Surgeon*, 1916. Oct. Vol. 39. No. 4. pp. 361–367.

[Substantially identical with CASTELLANI and MENDELSON's paper in the *British Medical Journal* (this *Bulletin*, Vol. 7, p, 256).]

MORESCHI (Carlo). Iniezioni antitifiche ed anticoleriche a scopo profilattico.—*Policlinico*, Sez. Med. 1916. Nov. 1. Vol. 23. No. 11. pp. 393–398.

NICHOLSON (M. A.). A Note on Cholera Inoculation carried out on the North-West Frontier, 1915.—*Indian Med. Gaz.*, 1916. Sept. Vol. 51. No. 9. pp. 338–340.

[No information to be obtained from the paper.]

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[A short description of the typical clinical features of the disease, its differential diagnosis from cholera nostras and arsenical poisoning, together with a brief account of the various media recommended for the isolation of the vibrio and the part played by carriers.]

PERGOLA (M.). Il sangue nella preparazione dei comuni substrati nutritivie come sostituto del peptone nella diagnosi batteriologica del colera.—*Igiene Mod.*, 1916. Vol. 9. pp. 33–38. [*Index Medicus.*]

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DYSENTERY (Bacillary and Unclassed).

(A.) Bacillary.

BOUDET (Gabriel). Une épidémie de dysenterie bacillaire observée pendant l'été de 1915, à Guercif (Maroc Oriental).—*Presse Méd.*, 1916. June 29. No. 36. pp. 281–284. With 6 curves.

[A simple account of an epidemic. Nothing new.]

HEHEWERTH (F. H.). Ueber Dysenteriebacillen und ihre Einteilung in Gruppen.—*Cent. f. Bakt.* 1. Abt. Orig., 1916. May 9. Vol. 78. No. 1. pp. 3–5. With 3 text figs.

——. Over dysenteriebacillen en de indeeling in groepen.—*Geneesk. Tijdschr. v. Nederl.-Indië*, 1916. Vol. 56. No. 4. pp. 470–489.

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(B.) Unclassed.

de ALMEIDA (Waldemar). Considerações clinicas sobre o tratamento das dysenterias.—*Arch. Brasileiros de Med.*, 1916. June. Vol. 6. No. 6. pp. 334–338.

[Brief notes, suggesting that the present-day use of sera in the case of bacillary dysentery, and of emetine in that of amoebic, does not entirely do away with the necessity of symptomatic medication by means of drugs. The author gives a list of the prescriptions that he commonly uses for this purpose, none of them very novel.]

BARRATT (J. O. Wakelin). A Search for Dysentery Carriers among Soldiers coming from Gallipoli and Egypt.—*Brit. Med. Jl.* 1916. Nov. 4. pp. 617–619.

DETRE (Ladislaus). Ein Fall von Lambliainfektion des Darmes.—*Wien. Klin. Woch.*, 1916. Aug. 10. Vol. 29. No. 32. pp. 1010–1012. With 4 text figs.

[The paper contains a poor and inaccurate account of the morphology of the flagellate and encysted stages of *Giardia intestinalis*, as observed in a single case by the author in Poszony. He refers to the organism by the old names of Lamblia and Megastoma, while the description of the mature cysts, as well as that of the young cysts, is quite incompatible with the accounts of other workers on the subject in most respects.]

ELLIOTT (John B.). Clinical Report of a Case of Diarrhoea apparently due to Flagellate Parasites.—*New Orleans Med. & Surg. Jl.*, 1916. Oct. Vol. 69. No. 4. pp. 308–311.

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[An abstract of a report by Professor Kuriazides which has been already noticed in this *Bulletin*.]

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di MATTEI (Eugenio). Il reperto batteriologico delle secrezioni catarrali delle vie respiratorie, nelle varie specie di peste cutanea.—*Malaria e Malat. d. Paesi Caldi*, 1916. July–Aug. Vol. 7. No. 4. pp. 225–229.

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U. S. PUBLIC HEALTH REPORTS. 1916. Oct. 13. Vol. 31. No. 41. pp. 2815–2816.—Plague, a Disease of Rodents.

WILLIAMS (C. L.). Diagnosis of Plague in Rats. The Advisability of making Routine Microscopic Examinations of Rats, Supplementary to the Macrascopic Examination.—*U.S. Public Health Rep.*, 1916. Aug. 18. Vol. 31. No. 33. pp. 2199–2205.

RELAPSING FEVER (and Spirochaetosis).

BABES (V.). Hémorragies méningées et autres manifestations hémorragiques dans la fièvre récurrente.—*C. R. Soc. Biol.*, 1916. Oct. 21. Vol. 79. No. 16. pp. 855–857.

GANE (T.) & BUÏA (I.). Sur les phénomènes méningitiques pendant la fièvre récurrente chez les enfants.—*C. R. Soc. Biol.* 1916. Oct. 21. Vol. 79. No. 16. pp. 864–865.

GWYN (N. B.) & OWER (J. J.). Infective Jaundice (Spirochaetosis Icterohaemorrhagica). A Preliminary Report.—*Lancet*, 1916. Sept. 16. pp. 518–519. With 4 text figs.

KNACK (A. V.). Zur Diagnose des Rekurrensödems. Bemerkungen zur Arbeit von Weltmann: Beitrag zur Klinik der sogenannten Oedemkrankheit.—*Wien. Klin. Woch.*, 1916. Aug. 10. Vol. 29. No. 32. pp. 1015–1016.

[A discussion as to the likelihood of oedematous conditions being really symptoms of spirochaetosis. The author seems to prefer serum reactions and blood examinations in diagnosis, as oedema is not universally present in cases of relapsing fever. His views probably are safer than those who contend that oedema is sufficient for diagnosis of spirochaetosis.]

MARTIN (Louis) & PETTIT (Auguste). Trois cas de spirochétose ictéro-hémorragique en France.—*Bull. Acad. Méd.*, 1916. Oct. 10. Vol. 76. Year 80. No. 40. pp. 247–253. With 2 text figs and 1 chart.

SANGIORGI (Giuseppe). Sugli spironemi della bocca.—*Pathologica*, 1916. Sept. 15. Vol. 8. No. 188. pp. 283–285. With 8 text figs.

STOKES (Adrian) & RYLE (John A.). A Note on Weil's Disease (Spirochaetosis Ichterohaemorrhagica) as it has occurred in the Army in Flanders.—*Brit. Med. Jl.*, 1916. Sept. 23. pp. 413–417. With 13 charts and 3 text figs; and *Jl. Roy. Army Med. Corps*, 1916. Sept. Vol. 27. No. 3. pp. 286–299. With 13 charts.

URBAIN (Gaston). Méningo-encéphalo-myé'ite des poules (? spirillose).—*Bull. Soc. Path. Exot.*, 1916. Oct. Vol. 9. No. 8. pp. 561–563.

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BALLIANO (A.). Osservazioni sopra l'ulcera rotonda fagedenica tropicale.—*Morgagni*, 1916. June 30. Vol. 58. Pt. 1. No. 6. pp. 205–217. With 1 plate.

BRAULT (J.). Note sur le *Trichophyton luxurians*, nouvelle espèce à culture faviforme, produisant des kérions.—*Ann. de Dermat. et de Syph.*, 1916. Mar. Vol. 6. No. 2. pp. 91–99. With 2 text figs.

—— & VIGUIER (A.). Les champignons des teignes rencontrées à Alger.—*Ann. de Dermat. et de Syph.*, 1916. July. Vol. 6. No. 4. pp. 169–185. With 3 text figs.

CASTELLANI (Aldo) & PINOY (E.). Notes on a New Ulcerative Dermato-Mycosis.—*Brit. Med. Jl.*, 1916. Oct. 7. p. 486. With 1 plate.

CHALMERS (Albert J.) & ARCHIBALD (R. G.). A Sudanese Maduromycosis.—*Ann. Trop. Med. & Parasit*, 1916. Sept. 30. Vol. 10. No. 2. pp. 169–222. With 4 plates.

—— & CHRISTOPHERSON (J. B.). A Sudanese Actinomycosis.—*Ann. Trop. Med. & Parasit*, 1916. Sept. 30. Vol. 10. No. 2. pp. 223–282. With 4 plates.

CHIEFFI (Alessandro). La tigne nella provincia di Napoli.—*Giorn. Ital. d. Malat. Ven. e d. Pelle.* 1916. July 26. Vol. 57. No. 3. pp. 140–169.

CRAIK (Robert). A New Ulcerative Dermato-Mycosis. [Correspondence.]—*Brit. Med. Jl.*, 1916. Oct. 28. p. 604.

JOHNSON (L. W.). A Case of Gangosa.—*U.S. Nav. Med. Bull.*, 1916. Oct. Vol. 10. No. 4. p. 667.

LOW (G. C.) & NEWHAM (H. B.). A Case of Ulcerating Granuloma successfully treated by Intravenous Injections of Antimony.—*Brit. Med. Jl.*, 1916. Sept. 16. pp. 387–389.

McNair (James B.). The Pathology of Dermatitis Venenata from *Rhus diversiloba*.—*Jl. Infect. Dis.*, 1916. Sept. Vol. 19. No. 3. pp. 418–428. With 7 text figs.

——. The Transmission of Rhus Poison from Plant to Person. *Rhus diversiloba* T. and G.—*Jl. Infect. Dis.*, 1916. Sept. Vol. 19. No. 3. pp. 429–432.

da Matta (Alfredo Augusto). Diagnóstico diferencial del Granuloma ulceroso y su tratamiento por el Emético.—*Gaceta Med. de Caracas*, 1916. July 31. Vol. 23. No. 14. pp. 105–107.

[A paper read before the Academy of Medicine of Venezuela on the subject indicated by the title, not containing anything very novel, though giving a good exposition of the facts.]

Ricono (M.). Tinea bovina—Sitsua (Basuto) Mna (Kaffir).—*S. African Med. Rec.*, 1916. July 22. Vol. 14. No. 14. pp. 212–216. With 2 plates.

——. Cases of Fibroma molluscum and Cheloid.—*S. African Med. Rec.*, 1916. Aug. 12. Vol. 14. No. 15. pp. 228–231. With 1 plate.

Ross (Philip H.). Dermatitis due to the Secretion of a Beetle in British East Africa.—*Jl. Trop. Med. & Hyg.*, 1916. Sept. 1. Vol. 19. No. 17. p. 202.

Ruiz-Arnau (R.). Recurrent Acrodermatosis of Warm Countries.—*Med. Record*, 1916. Oct. 14. Vol. 90. No. 16. Whole No. 2397. pp. 677–679.

Strickler (Albert). Differential Blood Counts in Parasitic Skin Diseases and their Possible Significance.—*Jl. Cutan. Dis. including Syph.* 1916. Oct. Vol. 34. No. 10. Whole No. 409. pp. 752–757.

Torres (Octavio). Observação de um caso de actinomycose: 2° caso observado na Bahia.—*Brazil Medico*, 1916. July 15. Vol. 30. No. 29. pp. 225–228.

Tyau (E. S.). Human Sporotrichosis, with Report of Case.—*China Med. Jl.*, 1916. July. Vol. 30. No. 4. pp. 233–235.

Urbain (Gaston). Un cas de gale démodectique du cheval. Contagion à l'homme.—*Bull. Soc. Path. Exot.* 1916. Oct. Vol. 9. No. 8. pp. 576–578.

SLEEPING SICKNESS (and other Trypanosomiases).

Chalmers (Albert J.) & O'Farrell (W. R.). Measurements of Dutton and Todd's Gambia Strain of *Trypanosoma gambiense* Dutton, 1902.—*Jl. Trop. Med. & Hyg.*, 1916. Aug. 15. Vol 19. No. 16. pp. 189–194. With 1 plate and 5 charts.

Duke (H. Lyndhurst). Trypanosomiasis in Northern Uganda.—*Jl. of Hygiene*, 1916. Sept. Vol. 15. No. 3. pp. 372–387. With a map.

Kofoid (Charles Atwood) & McCulloch (Irene). On *Trypanosoma triatomae*, a New Flagellate from a Hemipteran Bug from the Nests of the Wood Rat *Neotoma fuscipes*.—*Univ. California Publicat. Zool.*, 1916. Feb. 18. Vol. 16. No. 10. pp. 113–126. With 2 plates.

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NOVAES (Eucario). La trypanosomiase brésilienne et son rapport avec le corps thyroide. Travail fait à l'Institut pathologique de l'Université de Genève.—*Rev. Méd. de la Suisse Romande*, 1916. Sept. 20. Vol. 36. No. 7. pp. 592–614. With 2 plates.

VAN SACEGHEM (R.). Contribution à l'étude de la transmission du *Trypanosoma cazalboui*.—*Bull. Soc. Path. Exot.* 1916. Oct. Vol. 9. No. 8. pp. 569–573.

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TUBERCULOSIS IN NATIVE RACES.

MICHIE (H. Clay). A Tuberculosis Survey of an Alaska Eskimo Village. Using Children under the Age of 15 Years as an Index.—*Med. Record*, 1916. Oct. 14. Vol. 90. No. 16. Whole No. 2397. pp. 663–666. With 4 figs.

TYPHUS.

ARCHIVES DE L'INSTITUT PASTEUR DE TUNIS. 1916. Sept. Vol. 9. No. 4. pp. 215–290. With 62 charts.—Nouvelles études sur le typhus exanthématique pratiquées à l'Institut Pasteur de Tunis et dans les formations sanitaires de la Régence (1916.) [NICOLLE, BLAIZOT, POTEL & POIRSON.]

BABES (V.). Sur le diagnostic différentiel entre le Typhus exanthématique et certaines formes hémorragiques de méningite cérébro-spinale.—*C.R. Soc. Biol.* 1916. Oct. 21. Vol. 79. No. 16. pp. 857–860.

BLATTEIS (S. R.) & LEDERER (M.). The Bacillus of Typhus Exanthematicus isolated from a Case of Typhus Fever (Brill's Disease).—*Long Island Med. Jl.*, 1916. Vol. 10. pp. 169–172. [*Index Medicus.*]

BOUYGUES (Julien). Traitement du typhus exanthématique et du typhus récurrent par l'or et l'argent à l'état colloidal.—*Presse Méd.*, 1916. Sept. 7. No. 49. pp. 391–392. With 6 charts.

BULLETIN DE L'OFFICE INTERNATIONAL D'HYGIÈNE PUBLIQUE. 1916. July. Vol. 8. No. 7. pp. 1103–1141.—L'épidémiologie du typhus exanthématique dans les dernières années.

[A French translation of an article by Dr. Bruce Low (see this *Bulletin*, Vol. 8, p. 56.)]

CHESNEY (Lilian Mary). Typhus Work in Serbia.—*Practitioner*, 1916. May. Vol. 96. No. 5. (No. 575). pp. 542–550.

FELIX (Artur). Die Serodiagnostik des Fleckfiebers.—*Wien. Klin. Woch.*, 1916. July 13. Vol. 29. No. 28. pp. 873–877.

[An account of the value of the serodiagnosis of typhus as tested with a new strain of bacillus cultivated by him. The strain is termed strain X,19 and has been prepared in the German University at Prague.

FRIEDBERGER (E.). Kritische Bemerkungen zur Aetiologie des Fleckfiebers.—*Berlin. Klin. Woch.*, 1916. Aug. 7. Vol. 53. No. 32. pp. 882–888.

[A general account of the work of many recent workers on typhus].

GABBI (U.) & GIUGNI (Fr.) Tifo esanematico (Tifo petecchiale-Dermotifo). Pubblicazioni monografiche delle malatti degli eserciti in guerra della Scuola delle malattie esotiche annessa alla R. Clinica Medica di Roma.—*Malaria e Malat. d. Paesi*, Caldi, 1916. July–Aug. Vol. 7. No. 4. pp. 263–281. With 6 text-figs.

[An account of typhus on the lines of a modern textbook, embodying the recent researches of many workers, reviewed in greater detail in this *Bulletin*.]

HAIGHT (H. H.). Endemic Typhus Fever in Toronto.—*Canadian Pract. & Rev.*, 1916. May. Vol. 41. No. 5. pp. 185–191.

HAMBURGER (R.). Beitrag zur Unterscheidung von Typhus- und Fleckfieberroseolen.—*München. Med. Woch.*, 1916. June 27. Vol. 63. No. 26. pp. 952–953.

[A discussion of the opinions of various German workers on the differences of the rash in typhus and typhoid. No new features are given.]

HOEFFERN (Heribert Ritter) & DESCHMANN (Rudolf). Beobachtungen über Fleckfieber.—*Wien. Klin. Woch.*, 1916. June 29. Vol. 29. No. 26. pp. 820–821. With 5 charts.

[An account of some of the phenomena seen in 78 cases of typhus in Volhynia during January to March 1916. No new features appear to be described.]

KANNGIESSER (Friederich). Die Seuche des Thukydides (Typhus exanthematicus).—*Zeitschr. f. Hyg. u. Infektionskr*, 1916. Aug. 18. Vol. 82. No. 1. pp. 184–195.

[A synopsis of the symptoms, diagnosis, prophylactic measures, prognosis and therapy of typhus, in the baldest form, with long quotations from the works of Thucydides to show that these clinical features had been described in his writings. The work has no practical value.]

KER (Claude B.). Recent Literature on Typhus.—*Practitioner*, 1916. Sept. Vol. 97. No. 3. pp. 238–245.

[An account of some of the relatively recent work on typhus, all of which has been reviewed in this *Bulletin* from time to time. Bacteriology and epidemiology are more especially dealt with and reference is made to the review by Dr. Bruce LOW (see this *Bulletin*, Vol, 8, p. 56) on the latter subject.]

MCNEIL (H. L.). Endemic Typhus Fever in South Texas.—*Texas State Jl. Med.*, 1916. Aug. Vol. 12. No. 4. pp. 188–191.

——. A Case of Typhus.—*Texas State Jl. Med.*, 1916. Sept. Vol. 12. No. 5. p. 234.

[A report of a case of illness, probably typhus, observed at Galveston, in which it was believed that a pure culture of PLOTZ's bacillus was obtained on ascites-agar. Agglutination tests with positive sera had not been performed at the time of communication of the notes, but the author believes that the culture obtained was that described by PLOTZ as the agent of typhus.]

NICOLLE (C.) & BLAIZOT (L.). Sur les résultats de la sérothérapie dans le traitement du typhus exanthématique.—*Bull. Acad. Méd.*, 1916. Aug. 1. Vol. 76. Year 80. No. 31. pp. 95–101.

—— & ——. Sur la préparation d'un sérum antiexanthématique expérimental et ses premières applications au traitement du typhus de l'homme.—*Ann. Inst. Pasteur*, 1916. Sept. Vol. 30. No. 9. pp. 446–454. With 8 charts.

[This paper covers much the same ground as a previous one (see this *Bulletin*, Vol 8, p. 62) with the addition of longer accounts of the cases treated and the reproduction of the temperature charts of some of the cases.]

NOELLER (W.). Beitrag zur Flecktyphusübertragung durch Läuse.—*Berlin. Klin. Woch.*, 1916. July 10. Vol. 53. No. 28. pp. 778–780.

PÉTROVITCH. Considérations épidémiologiques et cliniques sur l'épidémie de typhus exanthématique au cours de la guerre actuelle en Serbie. —*Bull. Acad. Méd.*, 1916. Sept. 19. Vol. 76. Year 80. No. 37. pp. 206–209.

PIERCE (C. C.). Typhus Fever: Prevention and Control.—*Texas State Jl. Med.*, 1916. Aug. Vol. 12. No. 4. pp. 182–188.

——. Typhus Fever.—*Bull. El Paso Co. Med. Soc.*, 1916. Vol. 8. pp. 173–176. [*Index Medicus.*]

WEIL (E.) & FELIX (A.). Ueber die Beziehungen der Gruber-Widalschen Reaktion zum Fleckfieber.—*Wien. Klin. Woch.*, 1916. Aug. 3. Vol. 29. No. 31. pp. 974–978.

ZEMANN (W.). Komplikationen und Erkrankungen im Bereiche der oberen Luftwege und des Ohres bei Fleckfieber.—*Wien. Klin. Woch.*, 1916. Aug. 10. Vol. 29. No. 32. pp. 1014–1015.

YAWS.

HARPER (Philip). The Late Sequelae of Framboesia.—*Lancet*, 1916. Oct. 14. pp. 678–679.

YELLOW FEVER.

BREINL (A.). Le Diagnostic de la fièvre jaune.—*Bull. Office Intern. d'Hyg. Publique*, 1916. Sept. Vol. 8. No. 9. pp. 1455–1464.

[Translated from Commonwealth of Australia Quarantine Service Publication No. 6. See this *Bulletin*, Vol. 7, p. 294.]

CROPPER (John Westray). Report on the Examination of Human Blood in England for the Presence or Absence of "Seidelin Bodies." (*Paraplasma flavigenum*, the so-called Parasite of Yellow Fever).—*Yellow Fever Commission* (*W. Africa*). Reports on Questions connected with the Investigation of Non-Malarial Fevers in West Africa, 1916. Vol. 3. pp. 243–249. With 1 plate.

[The salient features of this Report were incorporated in a later paper by CROPPER and DREW (this *Bulletin*, Vol. 7. p. 298).]

Le FANU (G. E. H.). Some Observations on Fevers investigated in Quittah, March to June, 1914.—*Yellow Fever Commission* (W. Africa). Reports on Questions connected with the Investigation of Non-Malarial Fever in West Africa, 1916. Vol. 3. pp. 261–291.

STERNBERG (G. M.). Researches relating to the Etiology of Yellow Fever.—*Pan.-Amer. Soc. & Med. Jl.*, 1916. Vol. 21. No. 4. pp. 16–20. [*Index Medicus.*]

MISCELLANEOUS.

CLIMATIC BUBO, RAT BITE DISEASE, ROCKY MOUNTAIN SPOTTED FEVER, SCORPION STING.

da MATTA (Alfredo Augusto). Yodoterapia endovenosa en el Bubon Tropical.—*Gaceta Med. de Caracas*, 1916. July 31. Vol. 23. No. 14. pp. 107–109.

OLIVER (B. Chone). Scorpion Bite. [Correspondence].—*Med. Missions in India*, 1916. July. Vol. 22. No. 86. p. 71.

PIZZA (C.). Un nuovo caso di Sodòku.—*Morgagni*, 1916. Feb. 29. Vol. 58. Pt. 1. No. 2. pp. 67–80.

TREIBLY (C. E.). Climatic Bubo.—*U.S. Nav. Med. Bull.*, 1916. Oct. Vol. 10. No. 4. pp. 661–663.

UNITED STATES PUBLIC HEALTH REPORTS, 1916. Oct. 6. Vol. 31. No. 40. pp. 2753–2754.—Rocky Mountain Spotted Fever in California.

WOLBACH (S. B.). The Etiology of Rocky Mountain Spotted Fever. Occurrence of the Parasite in the Tick. (Second Preliminary Report).—*Jl. Med. Res.*, 1916. Sept. Vol. 35. No. 1. Whole No. 158. pp. 147–150.

ANNUAL REPORTS.

ASSAM. Annual Vaccination Returns of the Province of Assam for the Year 1915–1916 with Brief Explanatory Notes. [By Major T. C McCOMBIE YOUNG, I.M.S., Sanitary Commissioner, Assam.]—17 pp. 1916. Shillong: Printed at the Assam Secretariat Printing Office. [Price 11 annas = 1*s.* 0*d.*]

BIHAR & ORISSA. Administration Report on the Jails of Bihar and Orissa for the Year 1915. [By Lieut.-Col. B. J. SINGH, I.M.S.]—20 + lxxxvii + 2 pp. f'cap. 1916. Patna: Bihar & Orissa Govt. Press. [Price R.1 or 1*s.* 6*d.*]

BIHAR & ORISSA. Annual Returns of the Hospital and Dispensaries in Bihar and Orissa for the Year 1915. With Notes. [By Colonel G. J. H. BELL, C.I.E., M.B., I.M.S.]—5+ciii. pp. f'cap. 1916. Patna: Bihar & Orissa Govt. Press. [Price R.2–8 or 3*s.* 9*d.*]

BURMA. Report on the Prison Administration of Burma for the Year 1915.—103 pp. 1916. Rangoon: Office of the Superintendent, Government Printing. [Price R.2–8.0 = 3*s.* 9*d.*]

CENTRAL PROVINCES & BERAR. Notes on Vaccination in the Central Provinces and Berar for the Year 1915–16.—3+xix. pp. f'cap. 1916. Nagpur: Government Printing Press. [Price R. 1 = 1*s.* 6*d*].

CENTRAL PROVINCES & BERAR. Annual Sanitary Report of the Central Provinces and Berar for the Year 1915.—1916. Nagpur: Printed at the Government Press. [Price R.1 = 1*s.* 6*d.*]

PUNJAB. Notes on Vaccination in the Punjab for the Year 1915–16. [By H. HENDLEY, M.D., K.H.S., I.M.S.].—4+xiv pp. f'cap. 1916. Lahore: Supt. Govt. Printing. [Price R.0–9.0 or 9*d.*]

PUNJAB. Report on the Sanitary Administration of the Punjab and Proceedings of the Sanitary Board for the Year 1915. [By H. HENDLEY, M.D., K.H.S., I.M.S.] and the Report on Sanitary Work for 1915. [By V. STAINTON.]—20+xli pp. f'cap. 1916. Lahore: Supt. Govt. Printing. [Price R.1.2.0 or 1*s.* 8*d.*]

ROCKEFELLER FOUNDATION. International Health Commission. Second Annual Report. Jan. 1, 1915–Dec. 31, 1915. 185 pp. With 21 figs. 1916. Jan. New York: Offices of the Commission.

BOOKS.

DEADERICK (William H.) [M.D.] & THOMPSON (Loyd) [M.D.]. The Endemic Diseases of the Southern States.—546 pp. Roy. 8vo. Illustrated. 1916. Philadelphia and London: W. B. Saunders Co.

MAXWELL-LEFROY (H.) [M.A., F.Z.S.]. Measures for Avoidance and Extermination of Flies, Mosquitoes, Lice and Other Vermin.—17 pp. With 5 figs. 2nd Edit. Revised for the Tropics. 1916. London: W. Thacker & Co., Calcutta & Simla: Thacker, Spink & Co. [Price 1*s.* net.]

SIMPSON (W. J.), [C.M.G., M.D., F.R.C.P.]. The Maintenance of Health in the Tropics.—xi+174 pp. With 26 figs. 2nd Edit., 1916. London: John Bale, Sons & Danielsson. [Price 3*s.* 6*d.* net.]

UNCLASSED.

ARCE (Julian). La Medicina Tropical. Lección inaugural.—*Cronica Med.* Lima. 1916. Aug. Vol. 33. No. 638. pp. 239–248.

[An address, couched in general terms, on the development of tropical medicine in recent years.]

ARLO (J.). La méningite cérébro-spinale à Kindia, Guinée française (janvier–avril 1916).—*Bull. Soc. Path. Exot.* 1916. Oct. Vol. 9. No. 8. pp. 551–556. With 3 charts.

BARONSFEATHER (C. G. S.). Alcohol in the Tropics. [Correspondence.]—*Lancet,* 1916. Oct. 14. p. 692.

BRAHMACHARI (Upandra Nath). The Preparation of Stable Colloidal Antimony. [Correspondence.]—*Lancet,* 1916. Oct. 21. p. 728.

CANTLIE (James). Anatomical Data concerned in Operations on the Liver and in Clinical Examinations.—*Trans. Soc. Trop. Med. & Hyg.,* 1916. July. Vol. 9. No. 8. pp. 222–233. With 8 figs.

CARNOT (P.) & de KERDREL. La Pneumococcie épidémique des tropicaux. —*Paris Méd.,* 1916. July 8. Vol. 6. No. 28. pp. 37–43.

CARTER (D. W.). Jr. Hematochyluria. Observations on the Fat Content of the Urine and the Pathology of the Condition.—*Arch. Intern. Med.,* 1916. Oct. 15. Vol. 18. No. 4. pp. 541–550. With 3 figs.

CASTELLANI (Aldo). The Treatment of Certain Diseases of Protozoal Origin by Tartar Emetin, alone and in Combination.—*Brit. Med. Jl.,* 1916. Oct. 21. pp. 552–553.

CHAIX. Notes médicales à propos de mon séjour en Serbie.—*Bull. Acad. Méd.,* 1916. Feb. 22. 3 ser. Vol. 75. Year 80. No. 8. pp. 231–233.

[A brief account of the author's experiences in Serbia, April–October, 1915. Typhus, relapsing fever, diphtheria and malaria were the chief diseases seen. No details.]

CHALMERS (Albert J.) & MARSHALL (Alexander). Equine and Bovine Streptococci as Causal Agents of Human Infection.—*Jl. Trop. Med. & Hyg.,* 1916. Sept. 15. Vol. 19. No. 18. pp. 213–215; Oct. 2. No. 19. pp. 225–228.

ESCOMEL (Edmundo). Sobre un caso de blastomicosis.—*Cronica Med.* Lima. 1916. July. Vol. 33. No. 637. pp. 210–213.

FLETCHER (William). The Luetin Reaction in Syphilis.—*Lancet,* 1916. Oct. 21. pp. 710–711.

[A short account of the observations will be found in this *Bulletin,* Vol. 8. p. 217.]

GAUDUCHEAU (A.). Mélange colorant pour remplacer le Giemsa.—*Bull. Soc. Med. Chirurg. Indochine.* 1916. Sept. 10. Vol. 7. No. 8. 5 pp.

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